

Machine and Tool **BLUE BOOK**

A DIGEST OF THE METAL WORKING INDUSTRY

JUNE, 1948

THIS MONTH

Carbide "All Depth" Drills

Crushed Dressing

Central Lubrication of Machine Tools

Alodizing Aluminum

What's New in Metalworking

Available Literature

Advertisers' Products Index

Index to Advertisers

COMPLETE INDEX ON PAGE 5

A HITCHCOCK PUBLICATION

You can depend
on **MARVEL'S** 53
years of leader-
ship in both per-
formance and
service.



metal sawing is **MARVEL'S**
business. For 53 years **MAR-**
VEL has worked exclusively
in designing, developing
and building better metal
cutting hand saws, tools,
taps and dies than the world.

For **MARVEL'S** experience
and qualifications are the
result of all metal saw-
ing and working in all
branches of the industry
as a large and
experienced staff of
MARVEL'S 53 years
experience has made
them the most
reliable to you.

Write for Catalog
No. 10 contains a
large of metal
cutting
information.

ARMSTRONG-BLUM
MFG. COMPANY
3700
Bloomington
Chicago 39,
U. S. A.



MARVEL Metal Cutting
SAWS

ARMSTRONG-BLUM MFG. COMPANY

"The Hand Saw People"

5700 BLOOMINGDALE AVENUE

CHICAGO 39, U. S. A.

These NEW Hobart welders also generate A.C. power for lights and tools

Anywhere...any time!

For many years, Hobart has utilized the engine and generator of gasoline engine driven arc welders to produce D.C. auxiliary power in addition to welding current. Realizing the value of having more power on the job to operate tools, equipment and electric lights, Hobart has developed 2 new powerful units to take care of all your power requirements on work in the field.

One is a combination gasoline engine driven A.C. Arc Welder and A.C. Power Unit. You can do A.C. arc welding, or power A.C. tools, equipment and lights anywhere . . . any time -

with this unit. It's impossible for you to realize all its values until you see an actual demonstration.

The other is a conventional gasoline engine driven D.C. Arc Welder with either a 6 or 12 KW Auxiliary Generator for powering tools, equipment and lights anywhere . . . any time. Mail coupon today for complete details on these new arc welding machines with complete power supply!

The Hobart Bros. Co., Box TB-68 Troy, O.

Hobart

ONE OF THE WORLD'S LARGEST BUILDERS OF ARC WELDERS"



"Weldmobile" Self-Propelled Welders



Electric Drive Portable Welders



Gasoline Engine Drive Arc Welders



Industrial A.C. Type Arc Welders



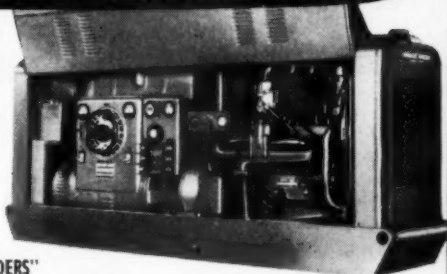
"Build Your Own" Generator Only



"Build Your Own" Welder & Power



above: Hobart 200 amp. A.C. Welder and A.C. Power
below: Hobart 400 amp. D.C. Welder and A.C. Power



Get Your "Vest Pocket Guide"

Completely revamped with many new welding helps added. A complete pocket guide for the welding operator, showing tables, charts, photos and other aids to improve welding work. Check coupon.

Free!



THE HOBART BROTHERS CO., BOX TB-68 TROY, OHIO
Send information on items checked, without obligation, please.

- ☐ "Vest Pocket Guide"
☐ D.C. Arc Welder with 6 or 12 KW Auxiliary Power

- ☐ Combination A.C. Arc Welder & A.C. Power
☐ New Catalog

Name _____
Firm _____
Address _____

ANOTHER *Plus* FEATURE OF THE *New* RIVETT 918 "STEELWAY" CABINET LATHE

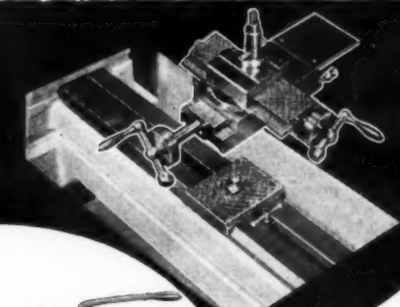
**SELF-ALIGNING
SLIDE
REST**

On most bench or cabinet type lathes, the compound slide rest aligns against the front narrow edge of the bedway. Such alignment is not automatic or fool-proof but depends entirely upon the operator. This type of mounting also makes it difficult to change the lateral position of the slide rest on the bed.

The compound slide rest of the Rivett 918 "Steelway" cabinet lathe mounts in any lateral position on a self-aligning shoe. Beveled edges of the shoe automatically square the slide rest with line of centers. The ability to position laterally is valuable on facing large diameters. Hardened and ground feed screws with large 2" diameter dials add to the precision of the lathe.

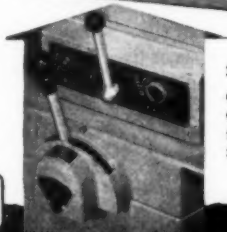
No other lathe has comparable slide rest features.

WRITE FOR BULLETIN 918SL



SPINDLE SPEED SELECTION

Correct spindle speed for any operation. Control lever affords any speed ranges from 120 to 2800 or 180 to 3750 r.p.m. Selected speed shows on dial.



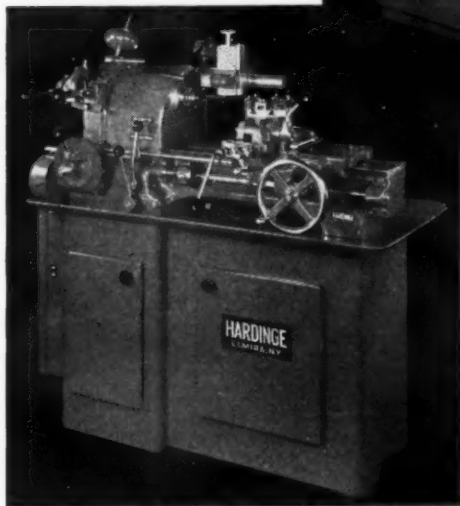
RIVETT


RIVETT LATHE & GRINDER, INC.

BRIGHTON • BOSTON • MASSACHUSETTS • U. S. A.


HARDINGE
ELMIRA, N.Y.

**HIGH SPEED
PRECISION
PRODUCTION
MACHINES**



 **SECOND OPERATION MACHINE:** 1" collet, 6" step chuck, 5" jaw chuck, capacity; eight spindle speeds to 4000 r.p.m.; preloaded ball bearing construction for spindle and turret; hardened and precision ground steel ways; turret and cross slide operating levers are adjustable to suit the operator.

Write for descriptive bulletin DSM59.

 **MULTI-OPERATION CHUCKING MACHINE:** This machine has the same capacity as the Second Operation Machine. In addition, it has an eight-position turret, production threading head and power feed for the carriage.

Write today for bulletin HP which shows how this machine can handle various jobs, using standard tool bits only for low-cost tooling.

The production of precision parts today requires tool room accuracy with high speed operation to reduce and then maintain lower costs. The above machines are both designed to increase the output of parts to extremely close tolerance and finish specifications. The precision qualities of these machines, combined with the simplicity of operation, assure lower costs.

HARDINGE BROTHERS, INC., ELMIRA, N. Y.

"PERFORMANCE HAS ESTABLISHED LEADERSHIP FOR HARDINGE"

Offices in principal cities. Export office, 269 Lafayette St., New York 12, N. Y.

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ARMSTRONG



**More Tools
Per Man
for
More Profit**



Even when labor was cheap and tools were costly, it was the best tooled shops that prospered. Now with wages higher and the work days shorter, it becomes imperative that every worker be supplied with every tool that will increase his hourly production.

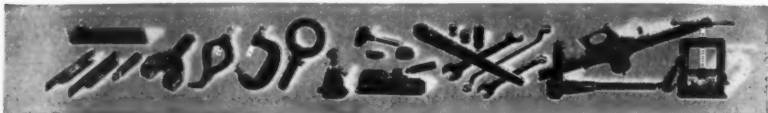
See that each lathe, planer and shaper operator has the correct ARMSTRONG TOOL HOLDERS for each operation he performs. Equip each machine with its full complement of ARMSTRONG Setting-up Tools. Use better balanced, handier ARMSTRONG WRENCHES on machines and assembly lines. Specify ARMSTRONG Drop Forged "C" Clamps and Lathe Dogs . . . Today, only quality tools can be truly economical.

Write for the ARMSTRONG Catalog. It has page after page of production-increasing cost-cutting tools.

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

5208 West Armstrong Ave., Chicago 30, Ill.
New York and San Francisco



Published Monthly

Volume 44, No. 6

Machine and Tool BLUE BOOK

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JUNE, 1948

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MULTI-PURPOSE
Anti-Scoring
LUBRICANT**



Highly concentrated. Withstands pressures greater than 50,000 lbs. per sq. in. Free of lead and graphite. Non-corrosive. Originated by CMD. ACCEPT NO SUBSTITUTES.

15 DROPS

Keep A Lathe Humming

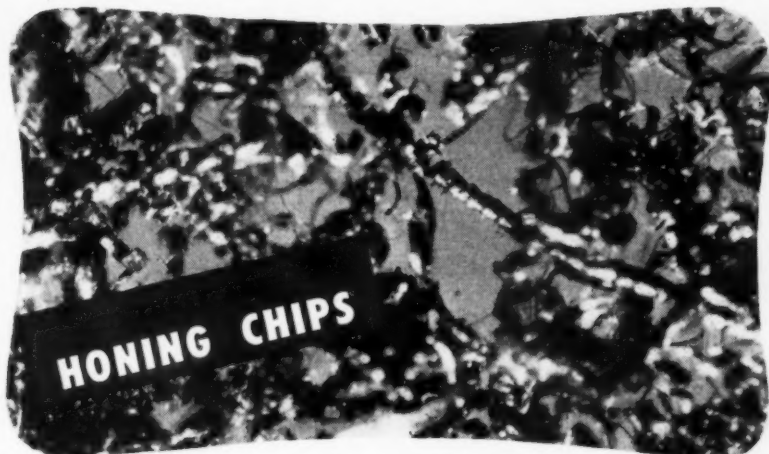
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| 1. Dead or live centers | 10. All Apron Gears |
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CMD Lubricants are available as oil or grease. Packed in 4 oz. tubes, cans (gallon, 5 gallons) and 55 gallon drums.

CHICAGO MANUFACTURING & DISTRIBUTING CO.
1928 W. 46th STREET CHICAGO 9, ILLINOIS



You get **FAST STOCK REMOVAL** by **HONING** **ON FULMER HONING MACHINES!**

The microphotograph above shows actual chip formation produced by honing on a Fulmer Honing Machine—the *fastest, most effective method* of finishing cylindrical bores. With Fulmer Machines, the abrasive stones *cut* the material off, rather than rub it away.

Fulmer Honing Machines handle bores from $\frac{1}{2}$ " to 30" diam. Stock is removed *fast* with a high degree of accuracy. Tolerance on size, straightness, roundness can be held to $\pm .0001$ ". Any surface finish ranging from 1 to 20 micro-inches RMS can be automatically produced.

Check these typical
production examples
of fast
stock removal
by Fulmer
Honing Machines

PIECE	LENGTH	DIAMETER	STOCK REMOVED	TIME
Hardened Pump Liner	27"	7.250" $\pm .0005$ "	.015"—.018"	0 min.
Forged Gear Blank	Two 6" Bores	4.250" $\pm .0002$ "	.005"	1 min.
Chrome Plated Diesel Liner	32"	8.500" $\pm .0005$ "	.004"—.006" of chrome	3 min.

Get more facts on how Fulmer Honing Machines save production time, cut costs, and improve quality on finishing cylindrical bores. Write for illustrated folder giving machine specifications.

C. ALLEN FULMER COMPANY

1242 First National Bank Bldg., Cincinnati, Ohio

FULMER PRECISION PRODUCTION EQUIPMENT

★ Honing Machines • Rod Borers • Piston Ring Lappers

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Above: A conventional setup. This overarm attachment, incidentally, has a single swivel head.

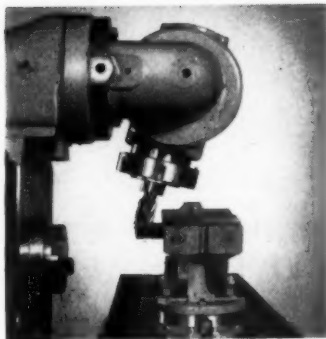
*This attachment
increases volume
of milling box
* 110%*



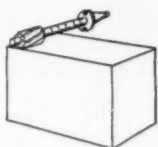
Above: CINCINNATI Motor Driven Universal Over-arm Milling Attachment. A self-contained unit, it is always in place; does not interfere in the least with normal usage of the machine; has nine speeds 100 to 1030 rpm



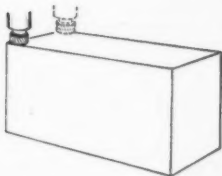
Right: In this illustration, the spindle carrier has been swiveled toward the column to mill the rake angle of a planer tool.



* 110% for CINCINNATI No. 2 MI. Other types in proportion to the specifications.



Volume of "milling box," No. 2
MI Plain Miller without attachment.



Volume of "milling box," No. 2
MI Plain Miller with attachment.

Left: Rotary milling the end of a
bushing. Here the attachment is
used for vertical milling operations.

● Every milling machine has a "milling box." It's the volume of the imaginary box in which chips can be cut, and is obtained by multiplying table traverse by vertical traverse by maximum cross adjustment of cutter position.

You can greatly increase all these capacity dimensions on your CINCINNATI knee-type milling machine with a CINCINNATI Motor Driven Universal Overarm Milling Attachment.

These attachments have a double swivel arrangement which swings the cutter spindle $7\frac{1}{2}$ " either side of the machine spindle, adding 15 inches to the reach of the cutter beyond the table traverse. In the vertical position, the attachment spindle nose is several inches above the machine spindle, adding an appreciable amount to the height of the cutter above the upper limit of vertical traverse. Adjusting the overarm from the innermost to the outermost position traverses the attachment spindle beyond the cross traverse cutting range of the machine. A CINCINNATI No. 2 MI Milling Machine, for example, gains 110% in volume of milling box. ¶ CINCINNATI Motor Driven Universal Overarm Milling Attachments may be applied to any CINCINNATI Milling Machine having a "rectangular" overarm (i. e., one which slides in dovetail ways). Complete data may be obtained by writing for catalog M-1213.

THE CINCINNATI MILLING MACHINE CO.

CINCINNATI 9, OHIO, U. S. A.

MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACHING MACHINES



IT TAKES SOMETHING EXTRA TO BE A *Specialist!*

It takes plenty of experience and the proper equipment to "land a big one"! It also requires technical skill and special machinery to produce high quality BATH ground thread taps!

Within our modern plant, precision equipment controls every important step of manufacture. Efficient machines have been designed by BATH to grind threads directly from the solid AFTER hardening, thereby avoiding any distortion. That's why stock and special size BATH taps give extra wear . . . increased production!

Let us help you solve your tap problems . . . see your BATH representative or write direct.

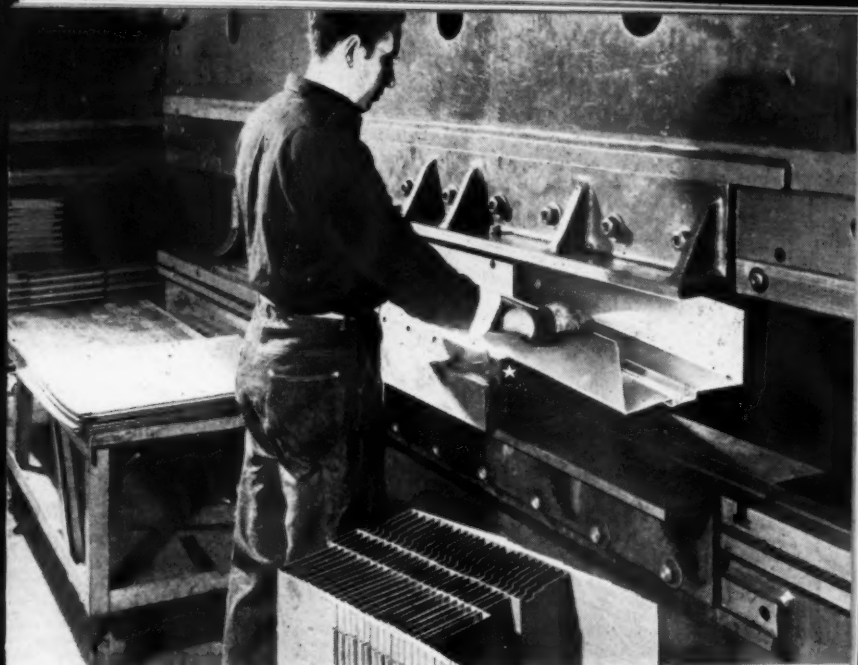
(Transportation is paid to your plant on all Bath products)

JOHN BATH CO.

INCORPORATED

14 Grafton Street
WORCESTER 8, MASS.

GROUND THREAD TAPS • PLUG AND RING TAPS • INTERNAL MICROMETERS



★ These dies are adjustable for various width drawers.

FINISHED

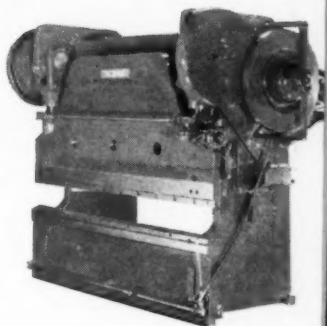
...IN *One* STROKE!

These wide dies, supported by removable angles, form six bends in these file cabinet drawers—finishing a drawer at each stroke of the ram.

It is production at low cost and illustrates the simple conversion of a Cincinnati Press Brake into a press. Remove the angles, and the machine is ready to function as a normal press brake.

The speed and accuracy in production, and the diversified functions of Cincinnati Press Brakes, keep them busy—make them profitable.

Write for Catalog B-2, illustrating many applications and uses of Cincinnati Press Brakes.



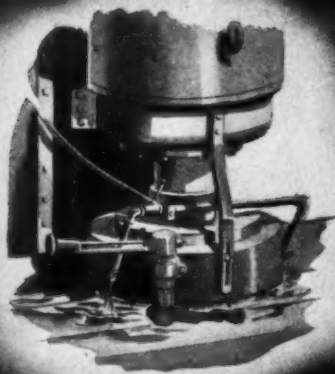
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CINCINNATI 25, OHIO U.S.A.

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FROM RAILROADS TO CUTLERY



Your only reason for buying grinding, buffing or cut-off equipment is to make production more profitable. To help you do this, Bridgeport makes machines known all over the world for ruggedness and advanced engineering. Bridgeport engineering includes not only equipment engineers but abrasive specialists. Perhaps most important of all we "live" with every installation until the buyer is completely satisfied that he never made a sounder investment in production machinery.



Your inquiry regarding Bridgeport Grinders will have prompt attention.

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FIRST in Grinding Equipment

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Horizontal, Vertical, Cutlery, Knife, Floor Grinders, Buffing Lathes, Cut-off Machines, Buxite Abrasive Wheels.

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Hammond

OF KALAMAZOO

• ABRASIVE BELT GRINDER-POLISHERS • POLISHING LATHES • "NO DUST" and "OK" GRINDERS •



3-4



5



6-7-8



6-7-8



16-17

ABRASIVE BELT AND WHEEL GRINDING POLISHING DEBURRING MACHINERY



9



14-15



12-13



10-11

CATALOG No. 325

THIS
20-PAGE
8 1/2" x 11"
CATALOG

shows our complete line of grinding, polishing, deburring machinery — polishing lathes, OK and NO-DUST grinders — mail coupon today for your copy.

FOR OTHER
Hammond
PRODUCTS
SEE
BACK COVER

Hammond Machinery Builders
1614 DOUGLAS AVENUE, KALAMAZOO, MICHIGAN

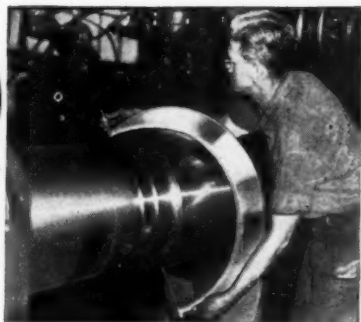
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we are interested—Please send us a copy of Catalog No. 325.

YES

Company Name _____ Title _____
Individual _____
Address _____ Zone _____ State _____
City _____

TUMICO Micrometer Offers Laboratory Measuring Accuracy On This Large Ship Journal

**Tubular Frame Provides
"Feather Touch" feel in Gaging to .001"
on 18" Ground Diameter—Rigid Micrometer
Structure Reduces Flexure Inaccuracies.**



Observe how easily the operator grasps this 24" mandrel type micrometer to gage the ground surface of this 18" diameter ship journal. You can depend upon Tubular micrometers to measure all work diameters with laboratory accuracy. Through scientifically engineered hollow frame structure instrument weight is reduced permitting "Feather Touch" feel on diameters up to and over 96". Rigid micrometer frame design with broad sectional surface through entire bow minimizes flexure inaccuracies.

MORE TIME SAVING—PROFIT PRODUCING TUMICO PRODUCTS FOR YOUR NEEDS.

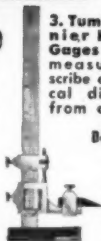


1. Tumico Calliper and Wire Gage is a combination measuring instrument. It will measure sheets and plates from 0" to 4". Wire gage slots are U. S. Standard No. 1 through No. 30. Markings are deep etched for rapid reading.



2. Tumico Tubular Micrometers feature "feather-touch" feel for making repetitive precision measurements. They are available in the

Series T fixed anvil type in size 0" to 30" and in Series M mandrel type in sizes from 0" to 96" both in sets or combination. Embodied in these micrometers are such important structural features as hardened and ground spindles, ground and lapped spindle threads, special alloy steel vacuum sealed frames, triple plated with copper, nickel and chrome and easy to read numerals.



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Write Today

—for further information about Tumico Precision Measuring Instruments for all standard and special requirements.

TRADE
TUMICO
MARK



4. Tumico Thrift Micrometers are economically priced units having drop forge steel frames, hardened anvils and spindle tips. They are available with ratchet stop and lock ring, or Vernier scale in size 0" to 6".

TUBULAR MICROMETER CO.

ST. JAMES, MINNESOTA, U.S.A. MILWAUKEE BRANCH
PLANKINTON BLDG.



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ROTARY FILES



SERVE ALL INDUSTRIES

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Jarvis Flexible Shaft Machines provide the ultimate in extra power and constant high speed to make tungsten carbide rotary files even more efficient.

Write for Literature on the quality line of Jarvis Power Tools.

Jarvis

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THE CHARLES L. JARVIS CO., MIDDLETOWN IN CONNECTICUT

Tapping Attachments • Tecni-Taps and Dies • Rotary Files
Flexible Shafts and Machines • Quick Change Chucks & Collets



"THE CREST
OF QUALITY"

Adds to the Prestige of Any Lathe

Though your lathe belongs to the Who's Who of Machine Tools, its standing will improve when it's equipped with a Skinner Chuck. This soundly designed tool is built to the highest standards to insure precision performance while increasing the productivity of any lathe.

Illustrated above is an independent chuck, one of the complete line of hand- and power-operated lathe chucks and chucking equipment made by Skinner. With a heavy, accurately machined body and rugged, individually adjustable jaws, it speeds the machining of round or odd-shaped pieces by holding the work securely and precisely for either heavy roughing cuts or fine finishing operations to extremely close tolerances.

Perhaps you are interested in replacing chucks on your older equipment. Perhaps you are buying or building new machine tools. In either case, add to the prestige of your lathes—use Skinner chucks. "The Crest of Quality." Write for the new Catalog No. 60 describing complete line of Skinner chucking equipment and machine vises.

The Skinner Chuck Co.

341 CHURCH STREET, NEW BRITAIN, CONN.

**Skinner
Chucks**



HAND & POWER OPERATED MACHINE CHUCKS - AIR CHUCK EQUIPMENT - FACE PLATE JAWS - MACHINE VISES

6/1/1900

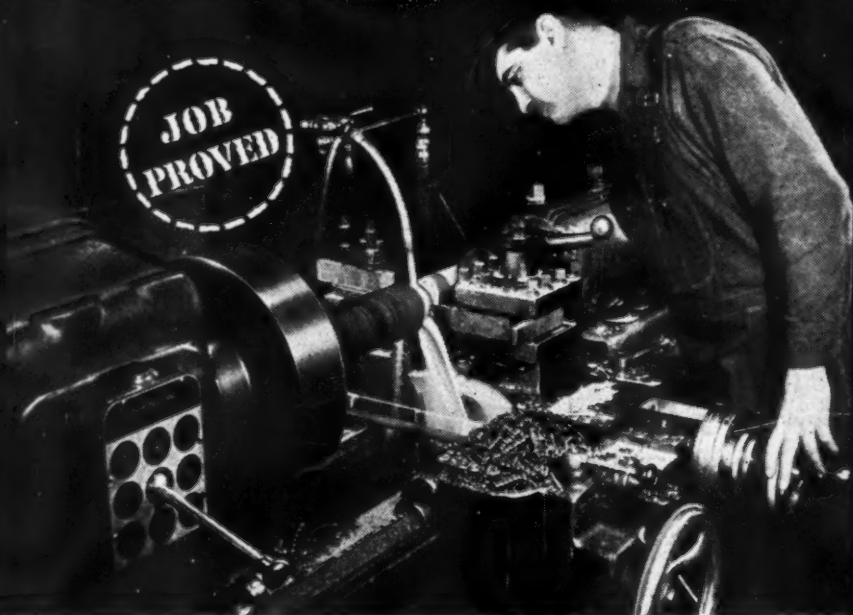


It took months of engineering to develop this ready reference Catalog. It's all yours — to save your time and assure you fine finishes and fast removal of metal.

No. 51

Address _____

$\frac{3}{8}$ " Cut on S.A.E. 4640 Steel



SUNOCO EMULSIFYING CUTTING OIL . . .

Permits Heavy Cut on 5" Heat-Treated Shaft

Here is a tough job, just one of thousands in which Sunoco makes possible fast, accurate machining:

Machine—20" x 96" "American" Pacemaker multi-production lathe
Operation—Turning 5" diameter shaft

Material—S.A.E. 4640 steel, heat-treated

Spindle Speed—133 r.p.m.

Cutting Speed—175 s.f.p.m.

Depth of Cut— $\frac{3}{4}$ "

Feed—.015"

Tool—Cemented carbide

Cutting Lubricant—1 part Sunoco to 20 parts water

For greater production, greater accuracy, smoother finish, put Sunoco, the "Job Proved" oil, to work in your shop. Sunoco quickly forms a stable emulsion when mixed with water. It has high lubricating and cooling qualities and is recommended for ferrous and nonferrous metals, alloy and carbon steels. For full information, or for a free copy of "Cutting and Grinding Facts," call the nearest Sun office, or write Department MT-6 :

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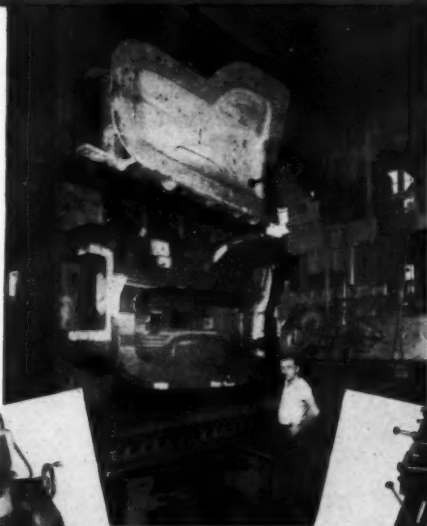


**INDUSTRIAL
PRODUCTS**

ANY MACHINE CAN BE TURCHAN-EQUIPPED

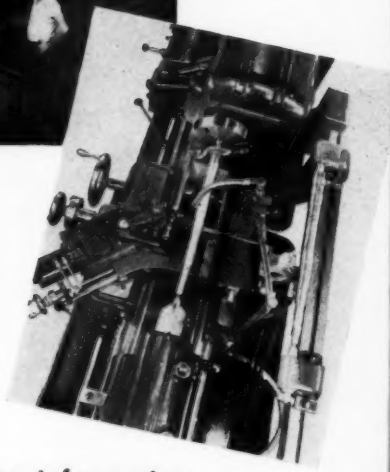
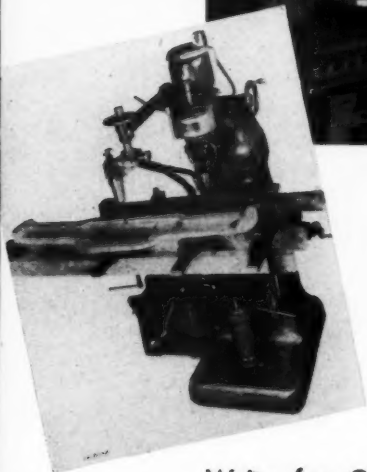
TURCHAN

•
**Oldest
Manufacturer
of
Duplicators**



TURCHAN

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For duplicating Dies,
Molds, Patterns or
original forms, from
hard or soft models,
with fidelity, accu-
racy and, extreme
rapidity.

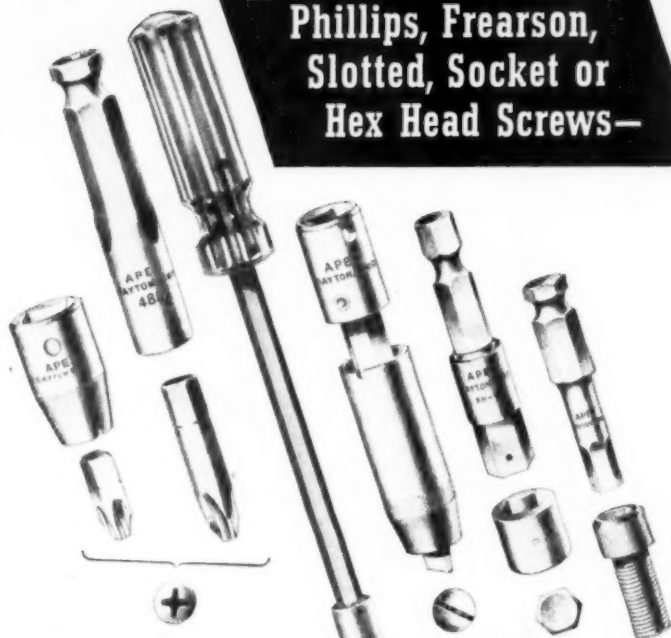


Write for Complete Information

TURCHAN FOLDING MACHINE CO.
225 E. Livingston St. Detroit, Mich.

Turchan

Phillips, Frearson, Slotted, Socket or Hex Head Screws—



— it's all the same to Apex

No matter what make of electric, air or spiral driver you use, Apex has the *right* bit for driving the types of screws listed above.

Apex bit holders do a big job and keep tool inventories to a minimum. You get the bit holders you need for *your* drivers—then simply order new tips as needed and discard the old ones.

Every one of these cost-cutting tools is made from shock resisting chisel steel, heat treated and tempered for maximum service.

Write for our Catalog Number 20.

APEX Screwdriver Bits

THE APEX MACHINE & TOOL COMPANY, 1029 S. Patterson Blvd., Dayton 2, Ohio

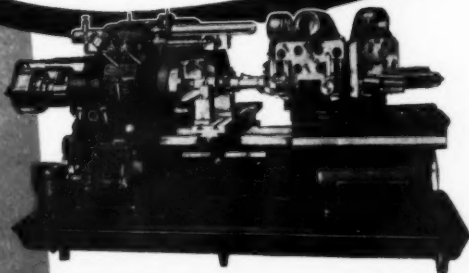
Safety Friction Tapping Chucks; Quick Change and Positive Drive Drill Chucks; Vertical Float Tapping Chucks; Parallel Floating Tool Holders; Power Bits for Phillips, Slotted Head, Frearson and Clutch Head Screws; Hand Drivers for Phillips, Frearson, Clutch Head Screws; Aircraft, Industrial Universal Joints; Sockets, Universal Joint Socket Wrenches

P&J

AUTOMATIC

Turret Lathes

5D-2 SPINDLE POWER FLEX



These 5D-2 spindle machines have been designed to meet production requirements when manufacturing operations necessitate an output in excess of that to be secured from a single spindle unit and frequent change overs are not a factor.

Check these important features: four automatic changes of spindle speed while under cut . . . three selective automatic changes of feed . . . automatic binding of the turret following index . . . powerful, direct cross slide action . . . constant, high speed motion to the cross slide and turret slide.

When maximum production efficiency is required, do not overlook the labor-saving, cost-cutting, Potter & Johnston 5D-2 automatic turret lathes.

**WRITE TODAY FOR
INFORMATIVE BULLETIN**

**Potter & Johnston
Company**

Pawtucket, R. I.

Subsidiary of

Pratt & Whitney

division Niles-Bement-Pond Co.

RACINE HYDRAULICS

Provide Dual Pressure — Solenoid Controlled

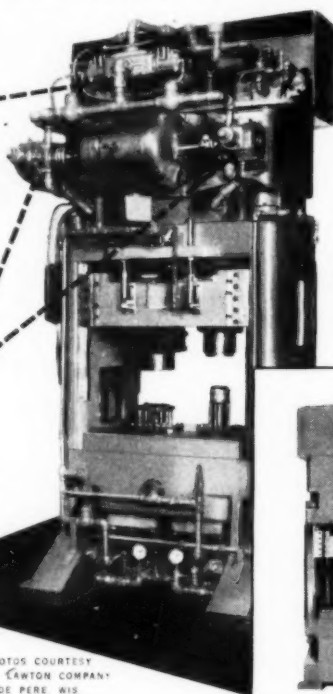


RACINE 4-WAY VALVE

Dual Solenoid pilot operated control valve — 2 or 3 positions. Available in sizes $\frac{1}{2}$ " to $1\frac{1}{2}$ " I.P.S., for electrical, hydraulic, mechanical or manual control.

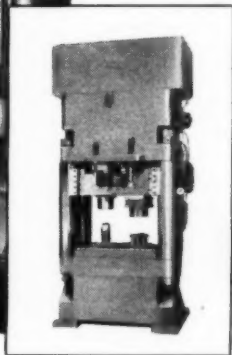


RACINE VARIABLE VOLUME PUMPS Pressure up to 1000 lbs. p.s.i. Featuring Variable Volume with automatic constant pressure control. Capacities to 30 g.p.m.



RACINE HYDRAULIC PRESSURE BOOSTER

Converts low pressure input into high pressure output. Various ratios to 7 to 1. Saves horsepower in two pressure systems.



PHOTOS COURTESY
C. A. LAWTON COMPANY
DE PERE, WIS.

This modern Lawton twin cushioned two die press operates through two RACINE Variable Volume Pumps and a RACINE Pressure Booster, controlled by a RACINE solenoid operated 4-way valve. High volume for the approach stroke, high pressure for the final closing action of the press, smoothly and positively applied, insure a clean steady drawing action. Your problems in the application of hydraulic force are given prompt and efficient consideration at Racine. Competent engineers are available in factory and field to develop hydraulic circuits that add to the design advantage of your product and the productivity of your shop equipment. Get full data today. Write for catalog P-10-C. RACINE TOOL AND MACHINE COMPANY, 1754 State Street, Racine, Wis.



RACINE

STANDARD FOR QUALITY AND PRECISION

This BULLARD 36" Cut Master is "really paying off" at Newport News Shipbuilding & Drydock Company. Here you see it taper boring a large valve. On this job, it also faces the flange and counter bores, as shown on the cross-sectional drawing.

**PERFORMANCE REPORT
FROM NEWPORT NEWS
SHIPBUILDING &
DRYDOCK COMPANY**

**CUTS COSTS 2 WAYS
ON CAST STEEL
VALVES
with a 36"
BULLARD Cut Master**

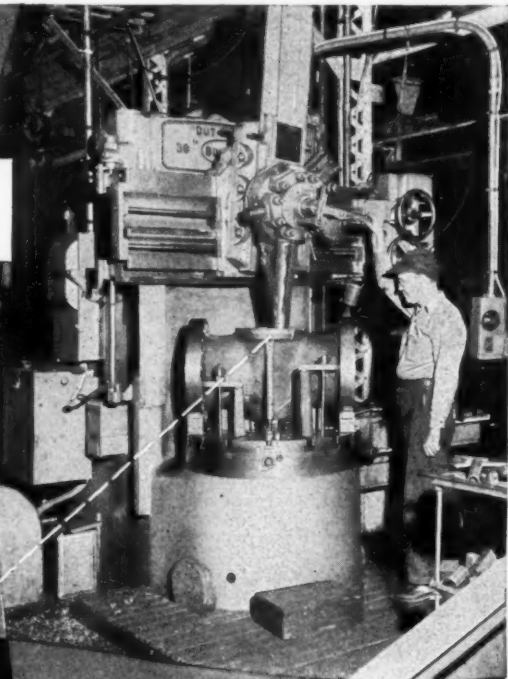
- 1. SAVED 33%
ON 3 OPERATIONS**
- 2. ELIMINATED A
GRINDING OPERATION**



Cross sectional drawing of valve with heavy lines indicating machined surfaces.

BULLARD

BULLARD CREATES NEW METHODS TO MAKE MACHINES DO MORE



You, too, can expect savings on most of your jobs.

It's easy to see why: The bed is cast in one heavy, rigid piece. Spindle is firmly supported top and bottom by large Timken roller bearings. Screw feeds provide and maintain a high degree of machining accuracy.

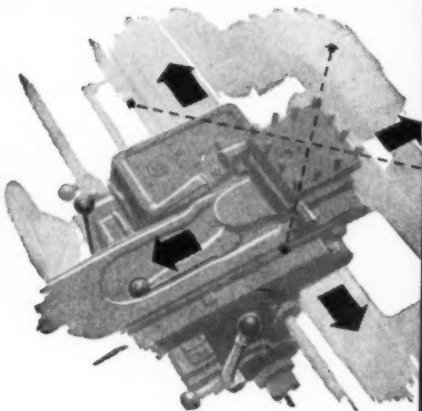
OTHER COST-CUTTING ADVANTAGES

Because the BULLARD Cut Master was designed specifically to save time on and between cuts, you find other unique features. The rapid and positive speed selection with the BULLARD pendant type control, limit-stops for simplified dimensional duplication, and centralized operating controls speed up operations and conserve costs.

For complete description of these and other distinctive features, as well as data on feeds, speeds and sizes, write for Bulletin CVTL-4-1 today.
THE BULLARD COMPANY, Bridgeport 2, Connecticut.

GISHOLT Saddle Type TURRET LATHES

*Exclusive
Versatility*



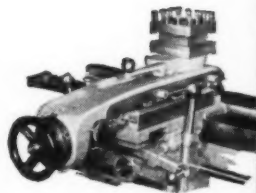
**Power Rapid Traverses for
side carriage and cross slide
are controlled by dual levers,
thus permitting them
to move independently or
together.**

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin



THE GISHOLT ROUND TABLE

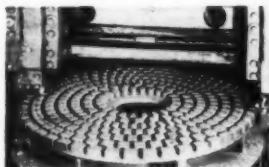
represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.



Gisholt's more versatile power rapid traverse reduces time lag between cuts, speeds production, saves time and money. This has been a standard Gisholt feature for over twenty years.

**TURRET LATHES • AUTOMATIC
LATHES • SUPERFINISHING
BALANCERS • SPECIAL MACHINING**

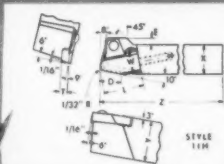
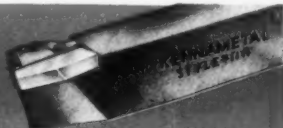
IF Interrupted Cuts Are Your Problem Learn About Kennametal



This iron casting has 288 chilled lump interruptions. A Kennametal standard Style 11T80 tool faces and turns it at 190 ft./min., .043" feed, and 1/4" depth of cut.



Kennametal bores, turns, and faces over interruptions and sand holes on this chrome-nickel steel rack pinion. Speed—155 ft./min., feed—.032"; depth of cut—1/4" to 5/16". Performance is 5 to 1 over high speed steel tools in production and pieces per grind.



Style 11N is one of a complete line of Kennametal tools, having sturdy, clamped-in, advanceable Kennametal tips. The assembly—developed by Kennametal—is highly successful on interrupted cutting, and is equally outstanding on continuous-cut operations. It utilizes Kennametal's high strength to best advantage—provides a thermally-stable assembly, makes possible deep cuts and heavy feeds, simplifies grinding sharp tip to advanced and re-sharpened without removing any steel from shank, and enables practically all of the Kennametal tip to be utilized for cutting.

You're probably enjoying the advantages of carbide tooling on continuous-cut operations—but how about interrupted cutting?

Has this given you tool trouble, and made you resort to slower machining methods on some important jobs?

If so, Kennametal will help you solve this problem. Its ability to withstand the shock of interrupted cuts, on both cast iron and steel, has been unequalled.*

Although cutting conditions are often improved by changing the tool shape so that the shock will be imposed on a section of the tip that is stronger and better supported, it is still the carbide that must take the punishment. Here's where Kennametal has a distinct advantage.

Because of exclusive processing methods and careful control in manufacture Kennametal's impact strength is unusually high for such a hard material—as great as that of hardened alloy steels having much lower hardness and compressive strength.

Still further advantages for interrupted cutting are obtained by the use of mechanically-held tools developed by Kennametal Inc. Tips of characteristically high impact strength are securely clamped to, and firmly supported by a heat-treated steel shank, to provide an exceptionally strong strain-free assembly.

If you have had difficulty with carbide tools on interrupted cuts, let us engineer Kennametal to the solution of your particular problem.

*Ask us to send you a set of *Performance Reports* that demonstrate the superior results obtained with Kennametal Tools on interrupted cutting.



KENNAMETAL Inc.

LATROBE, PA.

MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES
AND CUTTING TOOLS THAT INCREASE PRODUCTION

The LASSY Line of Tappers & Threaders

"Lassy Tappers measure as they tap"

\$18.75 ^{UP}

FEATURES

Tap capacity, No. 5 thru 1"

Pipe Taps to $\frac{3}{8}$ "

Adapters interchangeable on all Lassy equipment.

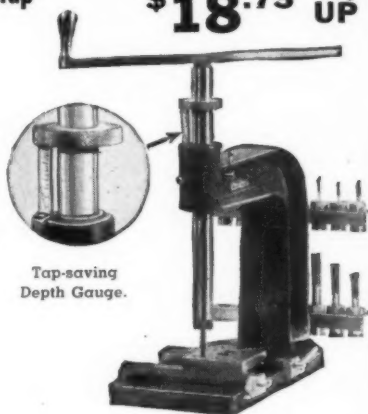
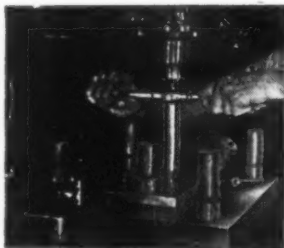
Stepped Holding Bars

Hollow single spindle for tap "feel".

UNIVERSAL TAP GUIDE

Designed for use in drill press, lathe and as an extension tap wrench.

Below, the Tap Guide is shown being used on the Moore Die Flipper on which it is standard equipment.



Tap-saving
Depth Gauge.

Low priced bench model
No. 12 for bench or wall
mounting.



Floor model Tapper and
Threader. The finest hand
tapping machine made.

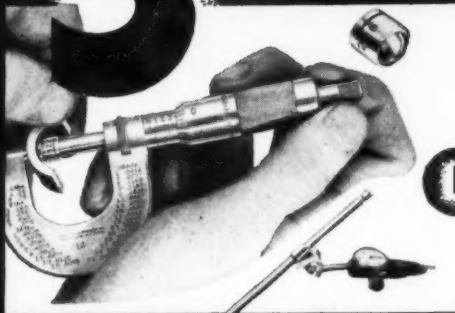
*In writing for
literature
please specify which
model inter-
ests you.*

The Tap Guide is ideal for all lathe
tapping and threading.

LASSY TOOL COMPANY 108 Bohemia Street, Plainville, Conn.

3

IMPORTANT ADDITIONS



BALL ATTACHMENT No. 226 for micrometer calipers

This attachment snaps on either anvil or spindle end of micrometer caliper to facilitate measurement of curved surfaces. Hardened steel ball bears firmly against measuring surface. Fits most micrometers with conventional anvils and spindles. Inexpensive.

1



2

DIAL TEST INDICATOR No. 743 with fine adjustment and magnetic base

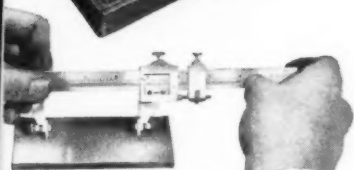
Makes difficult-to-reach measurements easy, accurate. Permanent magnet base holds indicator firmly to any iron or steel surface. Fine adjusting nut permits exact setting. For sale only in the United States of America and its Territories.



3

CENTER AND SMALL HOLE ATTACHMENT No. 573 for vernier calipers

Quickly converts a 6" or 150 mm. vernier caliper into a precision divider, or provides jaws with small points which permit measurements between very small holes. Set includes 2 each; clamps, center points, small hole points.



THESE INGENUOUS NEW DEVICES . . .

permit faster, simpler measurement of unusual-shaped parts, center distances or ordinarily inaccessible places with complete confidence in the accuracy of results. Their quality of craftsmanship and materials is typical of Brown & Sharpe standards in every respect. Write for complete details. *Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.*

We urge buying through the Distributor

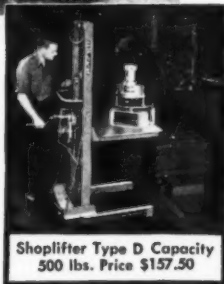
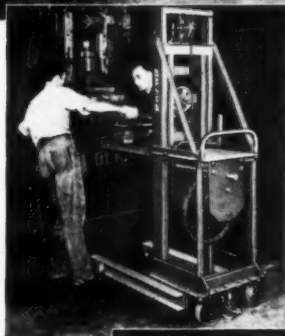
BROWN & SHARPE TOOL CO.

NEW, TYPE-DX

HEAVY DUTY Shoplifter

**Two Capacities
2000 lbs. and 1000 lbs.**

A larger, huskier version of the popular Type D 500 lb. Shoplifter, but retaining the easy handling features of the smaller lifter. Platform and base frame have an overall width of 24" that allows easy passage in narrow aisles, between presses, and through doorways. Hoisting unit is ball bearing equipped. Automatic friction-disc brake holds load at any point, not necessary to set or release pawl or brake device. Only 20 lbs. pressure is required on crank handle to raise or lower load. Extra heavy construction gives rigid stability that enables the operator to handle maximum loads with ease and smoothness. No other lifter of equal capacity on the market can match the Shoplifter for value. One user said: "It's a lot of machine for the money."



SPECIFICATIONS

CAPACITY—1000 lbs. and 2000 lbs.

OVERALL HEIGHT (to clear)—6'8".

PLATFORM LIFT—54".

PLATFORM PLATE—24" wide x 27 1/2" long (30" out from uprights).

BASEFRAME—24" wide x 50 1/2" long overall. Open end front.

BASE WHEELS—3" fixed wheels, 6" swivel casters with push bar steer.

HOIST UNIT (two capacities)—Ball bearing equipped, crank up and down action, automatic safety brake holds load at whatever point raised. Drum scored for cable.

PAINTED—Standard olive green finish.

PRICE—1000 lb. capacity.....\$320.00

2000 lb. capacity.....\$370.00

f.o.b. Chicago, freight prepaid to any destination in U.S.

Heavy duty foot operated floor lock.....\$15.00 Extra

ECONOMY ENGINEERING CO.

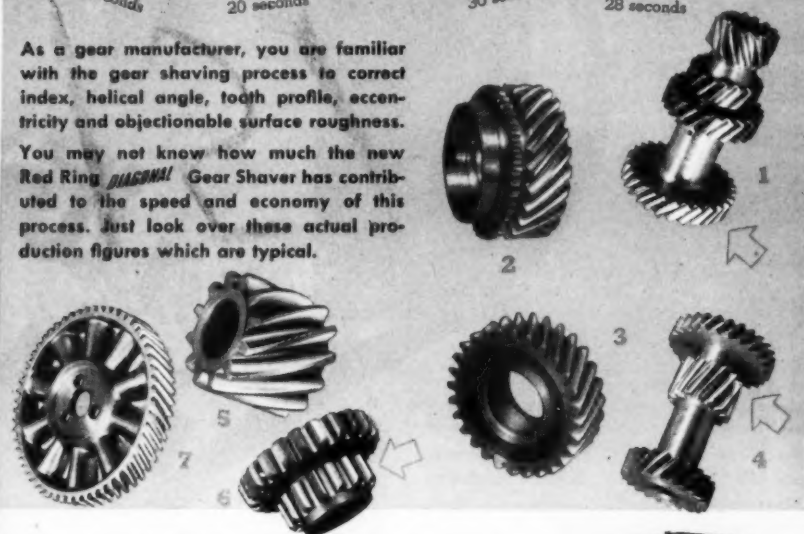
2635 West Van Buren Street, Chicago 12, Illinois

Shoplifter Type D Capacity
500 lbs. Price \$157.50

Actual Gear Shaving Production Figures

As a gear manufacturer, you are familiar with the gear shaving process to correct index, helical angle, tooth profile, eccentricity and objectionable surface roughness.

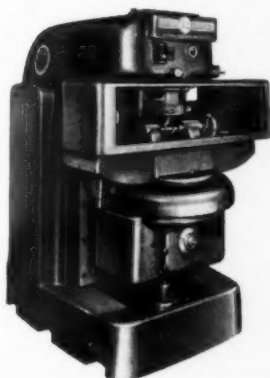
You may not know how much the new Red Ring *DIAGONAL* Gear Shaver has contributed to the speed and economy of this process. Just look over these actual production figures which are typical.



Gear	Material	Dis.	Face	Teeth	DP	Stock Removed over Pins	Machine Time
1	Steel	4"	1 1/16"	29	9.25	.010"	30 seconds
2	Steel	3 3/16"	1"	23	10.5	.010"	23 seconds
3	Cast Iron	2 3/16"	1 1/8"	28	10	.010"	20 seconds
4	Steel	2 1/4"	1 3/8"	14	7.6	.009"	28 seconds
5	Steel	1 1/8"	1"	12	13.5	.005"	9 seconds
6	Steel	2 3/16"	1 1/16"	14	6/8	.006"	15 seconds
7	Aluminum	6 1/2"	1"	56	10	.010"	25 seconds



For further information write for Bulletin S47-3 or, better still, consult a Red Ring Engineer.



NATIONAL BROACH AND MACHINE CO.
1400 ST. JEAN • • • • • DETROIT 13, MICHIGAN

X-RAY VIEW reveals advanced engineering and finest craftwork of precision mechanism inside the heavy-steel, streamlined case.

SAWS ANYTHING



Alloys
Aluminum
Asbestos
Brass
Bronze
Castings
Ceramics
Copper
Cork
Fabrics
Glass
Iron
Lead
Magnesium
Nickel
Paper
Pipe
Plastics
Plywood
Porcelain
Rubber
Steel
Tile
Tin
Zinc
Wood



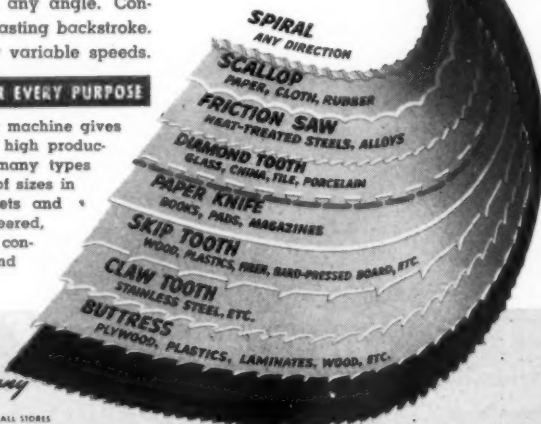
awl it
with a
DoALL

WORLD'S FASTEST STOCK-REMOVING PROCESS

Used in all industries to speed up production and slash costs, DoALL Contour Machining starts where ordinary bandsawing stops. Cuts all materials including hardest alloys. "Slices" off stock in minutes—no slow "whittling" to shape. External, internal, straight or curved cuts at any angle. Continuous cutting—no time-wasting backstroke. Smooth power at infinitely variable speeds.

THE RIGHT SAW BLADE FOR EVERY PURPOSE

The right blade on the right machine gives the "teamwork" needed for high production economies. There are many types of DoALL blades; hundreds of sizes in width and pitch; various sets and thicknesses. DoALL pioneered, patented, "strip-out" blade containers, protect fingers and keep blades undamaged.



The DoALL Company

REPRESENTATIVES
IN 56 COUNTRIES

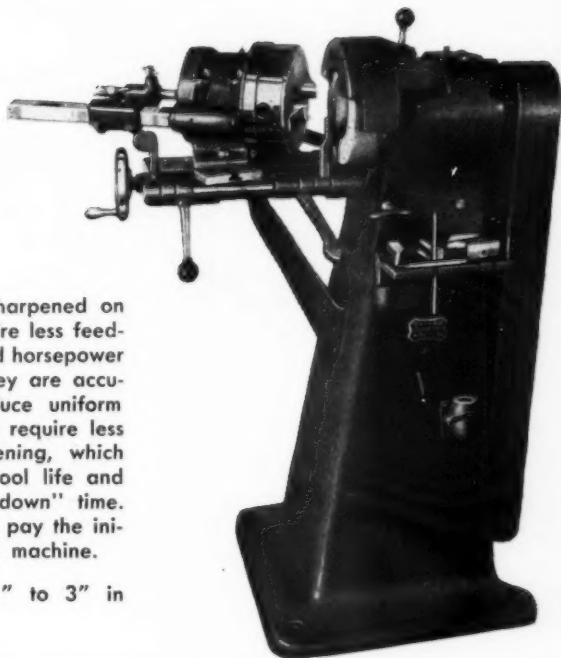
DoALL STORES
IN 257 CITIES

Des Plaines, Illinois

\$
\$ **More Holes**
For Your Toolroom Dollar . . .
The OLIVER 510 Drill Pointer

\$
\$
\$
\$
\$

**OLIVER
OF
ADRIAN**



Twist drills sharpened on the Oliver require less feeding pressure and horsepower to operate. They are accurate, and produce uniform holes . . . they require less frequent sharpening, which means longer tool life and less machine "down" time.

Savings soon pay the initial cost of the machine.

For drills $\frac{1}{4}$ " to 3" in diameter.

IMPROVE YOUR TOOLROOM
IT'S THE BACKBONE
OF PRODUCTION

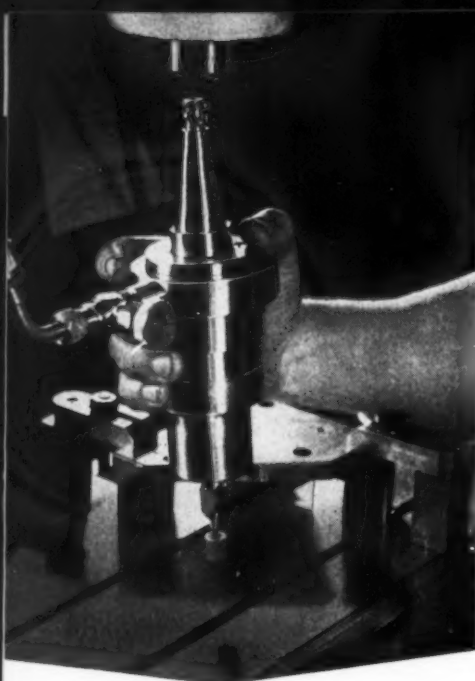


SEND FOR CATALOG

AUTOMATIC DRILL GRINDERS
TOOL & CUTTER GRINDERS—DRILL
POINT THINNERS—TEMPLATE
TOOL GRINDERS—FACE MILL
GRINDERS—DIEMAKING MACHINES

**OLIVER
INSTRUMENT
COMPANY**

1408 E. Maumee St.
Adrian, Michigan



Put on—take off—as you
would a boring chuck—
Jig Grind—on your Jig
Borer or Mill.

JIG GRINDING

with the
Vulcanaire

The Vulcanaire System . . .
Includes an adapter to fit the
spindle of your machine tool
Vacuum dust collector
Filter and Oiler
Pressure Gauge
Speed Regulator

When Jig Grinding is needed you can have it
quickly and economically with the VULCANAIRES.
Place it in the spindle of your jig borer (or mill).

AND . . . Locate—Finish Grind holes in hardened
steel to "tenths" at controlled speeds up to 65,000 RPM

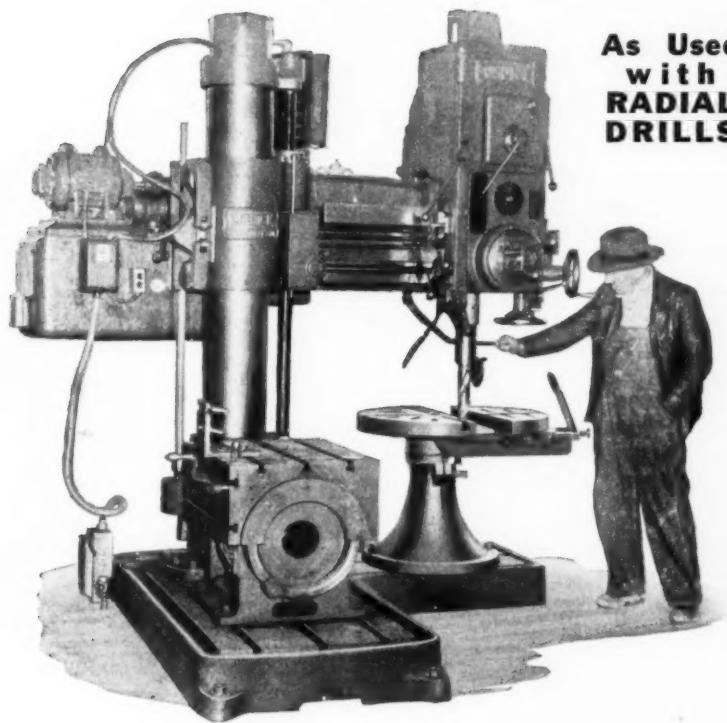
- . . Grind dowel holes—square with a ground base
- . . Move location of holes in hardened steel blocks
- . . Grind interchangeable holes in hardened sections
- . . Grind .032 to $\frac{1}{8}$ " holes with diamond impregnated
laps
- . . Grind contours and relief with tungsten carbide
burrs
- . . Grind radii in die sections
- . . Grind contours in gages

Write for literature—
for quotation, mentioning
machine tool application.

SAFETY DRILL TABLE

Mounted on Pedestal

**As Used
with
RADIAL
DRILLS**



A time-saving tool that we will be glad to ship you for **FREE TRIAL**. Write for Catalog.

MODERN MACHINE TOOL CO.
Jackson, Michigan



is the business end-
TAKE CARE OF IT

ON A

DETROIT



TAP RECONDITIONER



You can put worn taps right back in "good as new" shape with the DETROIT 4 in 1 tap reconditioner. It's like getting an almost unlimited supply of NEW TAPS for next to nothing, for this reconditioner is remarkably low in price—pays for itself in short order. It chamfers, grinds flutes (from 2 to 6), spiral points taps where required and polishes the points. Handles taps up to 1½ inch diameter.

*For complete information write or
 wire for Bulletin "DTR-4."*

DETROIT



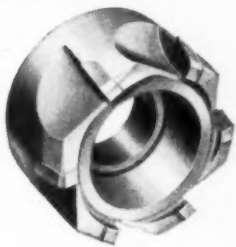
TAP & TOOL CO.

8432 BUTLER AVE. • DETROIT 11, MICHIGAN

The Home of "M-11" CHROME-COBALT HSS TAPS, THREAD MILLING CUTTERS & THREAD GAGES

if it's a l-o-n-g hard pull

USE BARBER-COLMAN CARBIDE-TIPPED MILLING CUTTERS



This solid, continuous cut in cast-iron, straight across a flat surface, is an ideal operation for B-C Carbide-Tipped Shell End Mills. Cutting Teeth, constantly engaged in the cut, need diamond-hard, sharp cutting edges to keep pace with production requirements. Constant contact with the material and the abrasive action formerly made frequent sharpening necessary with High Speed Cutters.

With B-C Carbide Shell End Mills, now used on the job, tool life is increased from 30 to 200 pieces per cutter sharpening, and production is increased 2 to 3 times over what was formerly obtained with HSS cutters.

Perhaps there are ideal conditions for carbide milling operations in your production lines. Carbide cutters cannot be expected to show

improved results on all milling jobs, but under certain conditions they show definitely superior production advantages. Why not send us specifications on one of your jobs, and let us recommend and quote the proper carbide cutters for your consideration. Call your nearest Barber-Colman representative today.

Barber-Colman Company

GENERAL OFFICES AND PLANT 110 LOOMIS ST., ROCKFORD, ILLINOIS, U.S.A.



JOB FACTS

Operation — Face mill four sides of machine table, each surface 5' wide x 27' long.

Material — Cast-iron.

Cutters — B-C Carbide Tipped Shell End Mills.

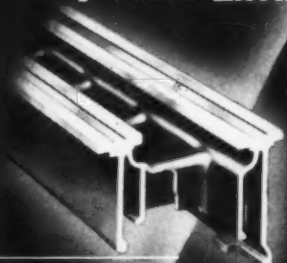
	HSS Cutter	C-T Cutter
Feed.....	.3" per min.	.814" per min.
Speed.....	45 S.F.M.	210 S.F.M.
Cutting Time	80 sides in 18 hours.	160 sides in 10 hours.
Tool Life.....	30 pieces per sharp.	300 pieces per sharp.



MODERN MACHINES

DEMAND Modern CUTTING TOOLS

SIDNEY ^{BONUS*} DESIGNED LATHES



All herringbone geared headstock provides 32 pre-selective changes of spindle speeds through convenient dial control. Spindle and intermediate shafts are equipped with center bearings in addition to end bearings. Spindle mounting automatically compensates for expansion caused by temperature rise.

*BONUS...

"Something given in addition to what is usual or strictly due"

... Webster's Dictionary

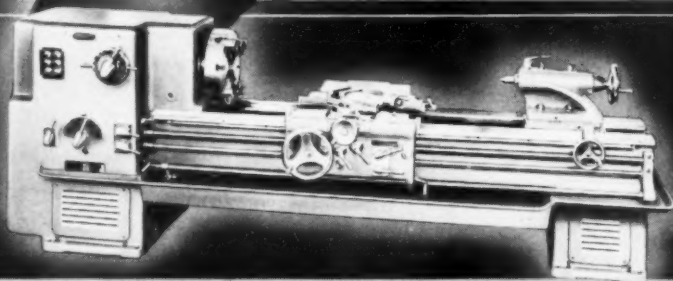
Rigid four-wall bed construction with double cross girts spaced at 12" intervals. Casting is of semi-steel nickel mixture for close grain structure.

Sidney's totally enclosed dial controlled gear box provides 80 changes of threads and feeds. All moving parts run constantly in oil.



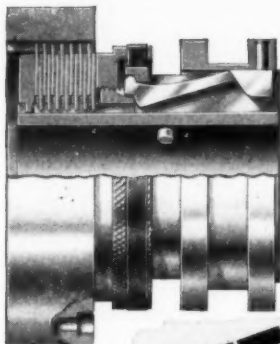
● More and more

manufacturers are taking advantage of the many outstanding construction features of Sidney Lathes that give them precision work — greater production — lower costs. That's why we call it Bonus Designed.



SIDNEY MACHINE TOOL COMPANY • SIDNEY, OHIO

Builders of Precision Machinery Since 1904



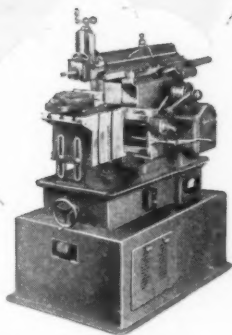
MAXITORQ

**KEEPS
GOOD
COMPANY**

The Sheldon Machine Co., Inc., permits us, this month, to feature their approval of the Maxitorq Floating Disc Clutch, now original equipment in their newest 12" capacity back-gear Shaper.

Located in the ram, the single clutch (with long, easy-grip handle) enables operator to stop mechanical motion of the shaper without turning off electrical current . . . secures instantaneous action for mechanical power.

Thus Maxitorq keeps good company with another in our growing national "who's who" list of machine tool builders.



If your machine, or your product, can use a trouble-free, floating disc, wet or dry type, single or double clutch (up to 15 H.P.) . . . investigate the exclusive design and patented features of Maxitorq.

Send your power transmission problems to our engineers for practical recommendations. They have a background of 42 years' experience in building one product . . . good clutches.

Send for Catalog No. BB6

ACJAB



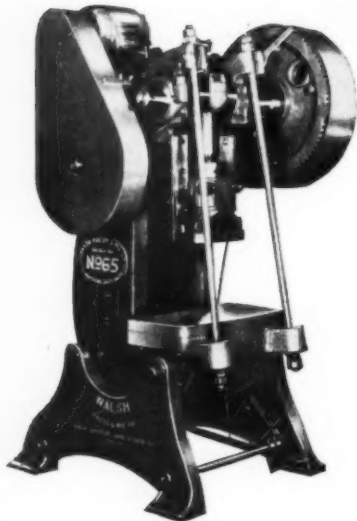
THE CARLYLE JOHNSON MACHINE COMPANY
MANCHESTER • CONNECTICUT

Tomorrow's Press is Yours Right Now!

Specifications

Bed area, 32 1/4" x 18 1/2";
Strokes Available up to
6"; Die Space 12" with
4" stroke.

**Walsh No. 65 Press
offers you new highs
for punch press output
and die life**



THE WALSH PRESS LINE

Walsh standard O.B.I. presses in capacities from 6 to 90-ton. Available back-geared. Also horn, arch and special presses. Send for Bulletin 447.

Check the features of this 65-ton capacity back-geared press:

HEAVY DUTY SEMI-STEEL FRAME: more than ample strength for capacity.

CRANKSHAFT of forged alloy steel, normalized and ground.

SAFETY LOCK prevents press from operating while changing dies.

CONNECTION BEARINGS scraped in for proper alignment and accuracy.

BALANCED FLYWHEEL has special cast bushing between flywheel and crankshaft bearing.

RAM or SLIDE is precision scraped for best possible bearing alignment between gibs and slide.

BED and face of slide line up within .002" for proper die alignment and long die life.
INCLINABILITY: positively locks in any position.

PLUS: crankshaft bearings scraped for proper bearing surface . . . All clutch parts of forged alloy steel . . . Pressure grease fittings to assure proper lubrication . . . Positive adjustable knockouts . . . Overload relay prevents damage to motor if die jams . . . The famous Walsh Safety Device is standard equipment.

WALSH PRESS & DIE CO.

4721 W. KINZIE ST. CHICAGO 44, ILL.

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DIVISION OF

AMERICAN GAGE & MACHINE COMPANY

SIZE CONTROL CO. DIVISION

Precision
Gages

WALSH PRESS & DIE CO. DIV.

Punch Presses

WACKER SALES DIVISION

(Affiliate)
Precision Inspection
Equipment

Engineering Representatives in Principal Cities

The CONE AUTOMATIC MACHINE COMPANY



sees many

GOOD THINGS AHEAD

It is reported that

To prevent explosions caused by sparks, Emil Greiner Co., 161 6th Ave., N. Y., offers an industrial mixer driven by air pressure

get ready with CONE for tomorrow

Ford Motor Co. makes dies of a bismuth-tin-lead alloy which is very soft and easily formed. When chilled to -320° F in liquid nitrogen, the metal is hard enough for use in six to ten stampings.

be ready with CONE for today

A machine that records magnetically and automatically in code is made by Codit Co. of 3535 Dell Trail, Chattanooga. The record can be played back intelligibly only on another machine set for the same code.

get ready with CONE for tomorrow

Metal "super crystals" are being made in the laboratory of the University of Virginia. They are as large as an inch in diameter, but have the same characteristics as the usual microscopic crystals.

be ready with CONE for today

A new thermometer made by Leeds & Northrup of Philadelphia measures temperatures down to 10 K with an accuracy of one hundredth of a degree.

get ready with CONE for tomorrow

Hycar P. A. is a new synthetic rubber made by B. F. Goodrich which has been tested at temperatures up to 400° F. without apparent loss in properties.

be ready with CONE for today

Plastic clamps to support wires or tubes are made by Holub Industries, Inc. They guard against cutting insulation and are non-conducting.

Associated Battery Assemblers have an automobile battery that can be taken apart, repaired and reassembled in 15 minutes.

get ready with CONE for tomorrow

Plastic gas pipe made of Tennessee Eastman's Tenite is replacing iron pipe in many installations.

be ready with CONE for today

California Institute of Technology is testing a "sweat cooling" system for jet engines. Coolant is forced through porous metal walls and cools by evaporation.

get ready with CONE for tomorrow

S. S. White Dental Co. is making dentists' burrs of cemented carbide.

FOLLOW THESE PAGES FOR NEWS OF PROGRESSIVE PRODUCTION

Stanolind Oil & Gas Co. will soon start production of motor fuel and other products from natural gas at Garden City, Kansas.

be ready with CONE for today

The purest helium ever distributed commercially (99.8% pure) will be made available by the U. S. Bureau of Mines. It will be known as "welding grade."

get ready with CONE for tomorrow

Paper pulp from southern New England and New York hardwoods is possible with a process developed at Polytechnic Institute of Technology.

be ready with CONE for today

U. S. Rubber is making an insulating material of foamed ureaformaldehyde that weighs only eight-tenths of a pound per cubic foot.

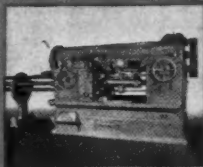
get ready with CONE for tomorrow

Magnesium alloys with twice the strength of those currently in use have been announced by the U. S. Army Corps of Engineers.

ADAPTABILITY and DEPENDABLE PERFORMANCE

Conomatics give BOTH

The sample shown illustrates a combination of ingenuity of method plus the facility of a good automatic to effect an 18-cent production saving per piece.



Cross section showing interior

Ask your CONE representative to show you our new color motion picture

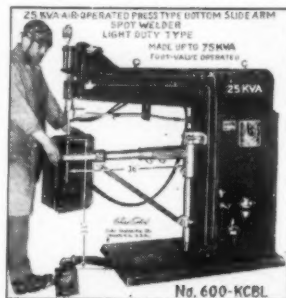
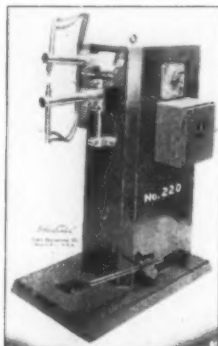
CONE

AUTOMATIC MACHINE CO., INC. ★ WINDSOR, VERMONT, U.S.A.

SPOT BUTT GUN ARC WELDERS

WE MANUFACTURE A COMPLETE LINE OF
RESISTANCE SPOT WELDERS
FOR ALL TYPES OF WELDING IN SIZES: 1/4 to 300 KVA.
WELDING TIPS, HOLDERS AND HORNS.
ASK FOR EISLER'S TIP AND WELDER CATALOG

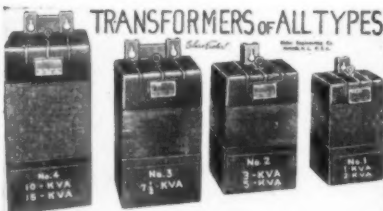
WE INVITE CONTRACT SPOT OR
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SMALL OR LARGE QUANTITIES



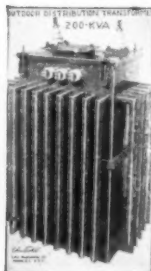
WE MAKE ALL TYPES OF TRANSFORMERS

SIZES FROM 1/4 TO 300 KVA

Furnace, Distribution, Lighting,
Power, Auto, Phase Changing, Air, Oil or
Water Cooled, Reactors and Special Trans-
formers of all types.



Oil Cooled Type



CHAS. EISLER
EISLER ENGINEERING COMPANY, INC.
762 South 13th Street (near Avon Avenue)
NEWARK 3, NEW JERSEY, U. S. A.



Arc Welders
100 TO 400 AMPS.



Butt Welders



FOOT
AIR
MOTOR
OPERATED

Spot Welders



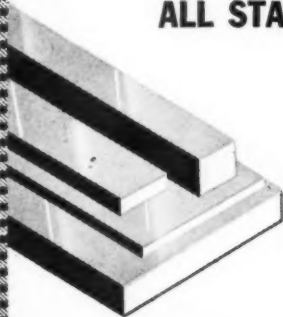
PRESS
TYPE

Spot Welders

FOOT, AIR
OR MOTOR OPERATED

Immediate Delivery!!

ALL STANDARD SIZES FROM STOCK



LENOX

Precision-Master

GROUND FLAT STOCK

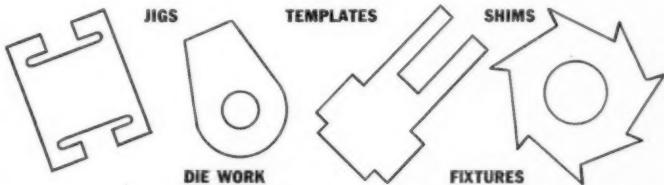
USAGE — Saves time and insures accuracy in making **TEMPLATES, JIGS, GAUGES, MACHINE PARTS, SHIMS, FIXTURES, TOOLS, and DIE WORK.** More economical for toolmakers to use as expensive machining and grinding operations necessary to bring mill stock to accurate measurements are eliminated.

PRECISION GROUND — Thickness within plus or minus .001" of specification, accurately squared on edges and ends. Smooth Finish.

STANDARD SIZES — 18" pieces 1/64" to 1" thickness in various widths. Individually packed in grease proof envelopes. Special sizes on application.

HEAT TREATMENT — Instructions on envelope. Can be either Hardened by Oil or Water Method.

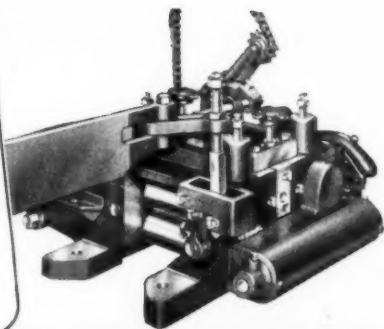
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AMERICAN SAW & MFG. CO.

SPRINGFIELD 1, MASS.

**Assures Fast
Safe-Accurate
Feeding of
Coiled Strip Stock**

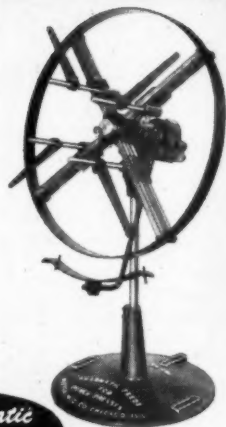


WITTEK *Automatic* **ROLL FEEDS AND REEL STANDS**

For All Types of Punch Presses

Wittek *Automatic Roll Feeds* provide maximum efficiency in the high speed automatic feeding of all types of coiled strip stock to punch presses. Highly flexible in function and application, they are capable of feeding lengths up to 24" per stroke of the press and will handle various stock thicknesses in widths up to the maximum width of the rollers.

Wittek *Adjustable Reel Stands* provide automatically expanding coil holders that center the coil and assure maximum production by eliminating looping, tangling and back lash of stock. If your production problem involves feeding coiled stock to punch presses, consult us. Your inquiry will be given immediate attention. Ask for completely descriptive catalog.



WITTEK Manufacturing Co.

4305 W. 24th Place, Chicago 23, Illinois

Automatic
ROLL FEEDS
and
REEL STANDS



**QUIET
ZONE
AIR
FILTERING**



***Stops
Corrosive
Moisture***

***You
KNOW IT
because you
SEE IT***

THE *New* NORGREN TRANSPARENT BOWL FILTER

gives your air tools and cylinders effective protection against corrosive moisture and emulsions as well as abrasive solids.

- Directional air inlet (Tornado Jet) imparts swirling motion, separating and throwing moisture to outside wall.
- Moisture runs down below baffle plate.
- Baffle plate divides bowl into ACTIVE and QUIET zones—active, where moisture separation takes place, quiet, where moisture accumulates for draining off instead of being driven along due to exposure to air turbulence.
- Reinforced Monel wire screen stops all solids.
- Transparent bowl shows condition of filter at all times.

***Write for Detailed Information. C. A. NORGREN, 222 SANTA FE DR.
DENVER 9, COLORADO***

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WORKS by itself

Soluble oil and water coolants are clarified automatically in the Hoffman Flotation unit. Sump cleaning is eliminated—there are no filter aids to add or change—no screens to plug—no need for constant, costly maintenance.

The principle of the Hoffman unit is simple, unique and entirely mechanical. Dirty coolant enters a tank and is aerated by a rotor-stator. Waste solids are held in suspension by froth and skimmed off, in near-dry condition, automatically.

and **PAYS** for itself

Productive time is increased because machines can be operated continuously without "down" time and labor for cleaning sumps. Wheels, diamonds and soluble oils last longer. On top of these savings you get better, faster machining—vastly improved quality control. In the actual experience of scores of users, these savings have been more than enough to write off the cost of Hoffman Flotation units in incredibly short periods. Ask us to furnish the facts.

HOFFMAN fully automatic **FLOTATION EQUIPMENT** for **COOLANT** **CLARIFICATION**



Hoffman Flotation equipment is built in standard sizes with flow rates from 20 to 1,000 gallons per minute. Larger sizes built to specification.

The complete line of Hoffman coolant clarification equipment also in-

cludes Pressure, Vacuum, Cartridge and Disc Filters. Also, the new Hoffman Oil Conditioner Unit for removing soluble and insoluble impurities. Literature and a Free Survey are available without obligation—ask for them now.

Get full details and a FREE Survey

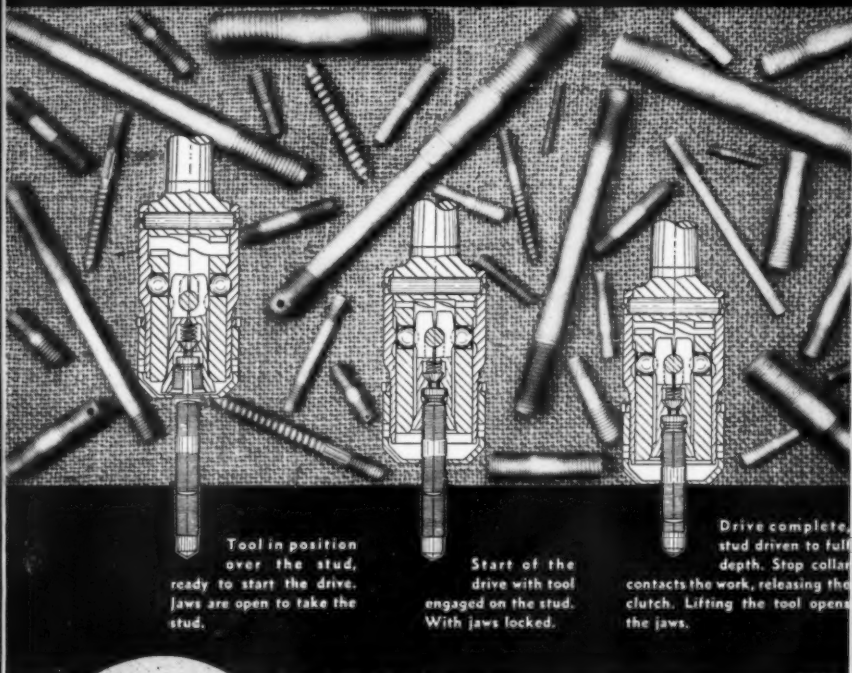
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**MACHINERY
CORPORATION**
215 Lamson St., Syracuse, N. Y.

COOLANT FILTERS • FILTRATION ENGINEERING SERVICE

STUDS

and the tool to set them



Tool in position over the stud, ready to start the drive. Jaws are open to take the stud.

Start of the drive with tool engaged on the stud. With jaws locked.

Drive complete, stud driven to full depth. Stop collar contacts the work, releasing the clutch. Lifting the tool opens the jaws.

MODERN SELF-OPENING STUD SETTER

As the action of this tool is positive and automatic, it is conveniently operated in any position with either air or electrically operated portable tools. It is also adapted to use in a drill press where it is possible to drill and tap the holes and set studs in successive operations.

Let Modern Engineers help with your stud setting problems—send for Bulletin M-186

MODERN TOOL WORKS

DIVISION OF
CONSOLIDATED MACHINE TOOL CORPORATION
ROCHESTER 10, NEW YORK



**50% more
working
surface**

WITH MERZ UNIVERSAL CHECKING PLATES

MERZ Universal Checking Plates are of unique design, with all attachments connected on the outside. The result is 50% more working surface—an advantage found only in MERZ.

You can depend on Merz Checking Plates and Fixtures to speed up complicated checking operations. Bench centers and "V" blocks are fitted by exclusive design, with angle groove in master plate and attachments. This maintains positive pressure against edge and surface at all times. Various attachments, including a 20" sine bar fixture, offer a wide range of checking combinations not available with standard units.

MERZ Universal Checking Plates and Fixtures are cast from special, fine-grained gray-iron alloys—are extremely rigid and unconditionally guaranteed against warpage. Available in a wide range of sizes to meet every requirement.

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MERZ



now *The*
MAGNA-SINE WITH
Permanent Magnet
CHUCK
SAME ACCURACY
New VERSATILITY

CORDS, transformers or other electrical equipment are no longer needed to use the new Magna-Sine . . . the Magna-Sine now is available with a permanent magnet chuck.

The permanent magnet Magna-Sine is not only more convenient to use, it is more versatile, too. It may be used on wet or dry grinding operations. The amount of magnetic power can be adjusted to suit the application.

Magna-Sines with electric magnet chucks are still available.

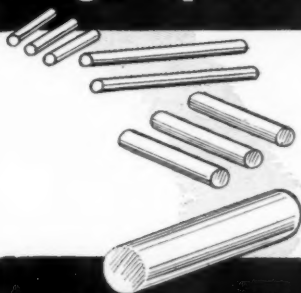
Thousands of Magna-Sines are in daily use with electric magnet chucks. These units have proved to be the accurate answer for hundreds of precision angular set-ups. The addition of the permanent magnet chuck to the Magna-Sine now makes it the economical unit for every precision angular set-up. Write today for prices and catalog. **Robbins Engineering Company, 318 Midland Avenue, Detroit 3, Michigan.**

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Producers of **ROBBINS MAGNA-SINE • ROBBINS UNIV-ANGLE
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 ROBBINS No. 3 DRILLMATIC • SPECIAL MACHINERY.**

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Precision ROD CUTTING at High Speed



with the New
**DI-ACRO
ROD PARTER**

This newest member of the DI-ACRO family of "DIE-LESS DUPLICATING" Machines brings you accuracy, speed, capacity range and ease of operation fully up to the standards established by DI-ACRO Precision Benders, Brakes, Shears.

Do you require precision?—The DI-ACRO Rod Parter holds tolerance to .001" on duplicated cuts. The ends are square, and roundness is maintained.

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Shows parts produced without die expense or delay by DI-ACRO Benders, Brakes, Shears, Rod Parters, Notchers, Punches. Send for your free copy.

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"PARTS OFF" MANY MATERIALS

All hot and cold rolled rods

Stainless steel

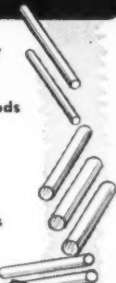
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BEATS SPIRALS 2 TO 1

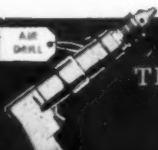
THIS manufacturer of steel kitchen cabinets was using hand spiral screw drivers to fasten hinges on doors because they never found a power screw driver light enough to hold in one hand while other hand holds the door. Screws are self-tapping type, size 8-32. The Rotor Application Engineer had the answer: Use the 26-ounce Rotor Air

Screw Driver. They did, with these results

Output doubled. Twice as many hinges are screwed on per day with this "fly-weight" 1000 R.P.M. Air Powered Screw Driver. Cuts costs 50%.

We'd be glad to tackle similar problems in your plant.

AIR O'TOOL



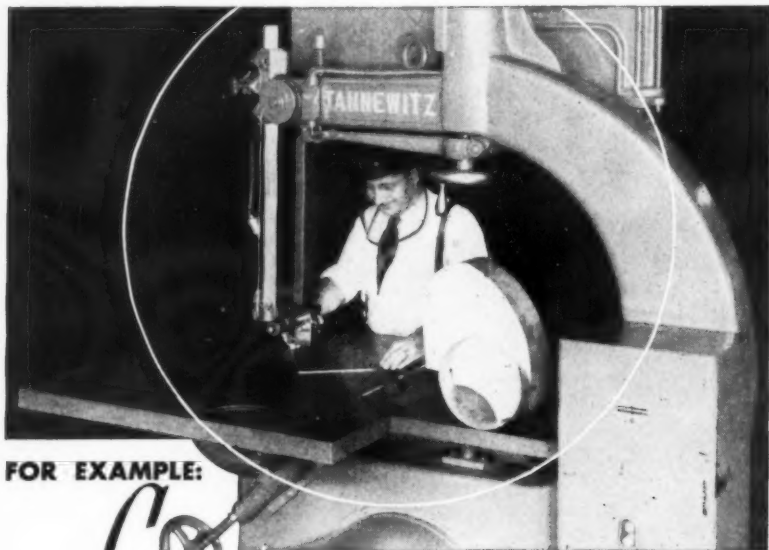
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CLEVELAND, OHIO



FRICTION SAWING

solves thousands of Problems!



FOR EXAMPLE:

CUTTING side panels of a barometric damper as shown above. Cost of dies required for seven sizes would have approximated \$12,000—a prohibitive sum for volume required on these sizes. Friction-sawn on a TANNEWITZ High Speed Band Saw in multiples of two in 1.2 minutes each—a very moderate cost which makes feasible the complete line required. Cost of machine was only a small fraction of cost of dies contemplated and it is also available for many other uses.

For trimming castings, formed parts, cutting metal as hard as a file and dozens of other operations, too, friction sawing with TANNEWITZ High Speed Band Saws offers tremendous advantage. Write for free booklet, "FRICTION SAWING."

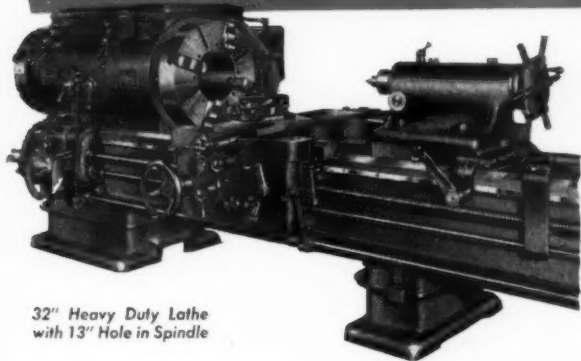
THE TANNEWITZ WORKS

**GRAND RAPIDS 4,
MICHIGAN**

SAVE TIME - CUT COSTS

DO IMPORTANT MACHINING JOBS IN 1/2 TO 1/7 THE TIME!... ON A **HYDRATROL LATHE**

(Large Hollow Spindle Type)



32" Heavy Duty Lathe
with 13" Hole in Spindle

4 sizes - 18" to 36"

Small, 18" up to 7-1/8" H

Medium, 25" up to 12-1/8" H

Large, 32" up to 16-1/8" H

Large, 36" up to 16-1/8" H

LEHMANN is the Leader in Progressive Engine Lathe Design!—say hundreds of machine shop superintendents. These men who know say that LEHMANN has the most complete line of Large Hollow Spindle type lathes manufactured. It's a line that incorporates all the famous features of the Hydratrol headstock, and

the ruggedness and power of LEHMANN design... No wonder that Hollow Spindle HYDRATROLS, in hundreds of plants, are setting new records for speed, accuracy, dependability, economy. You'll do it better on a HYDRATROL! Send us prints, a specific, time-and-money-saving recommendation.

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CHOUTEAU AT GRAND • ST. LOUIS 3, MISSOURI



Barker

Two-Jaw or Three-Jaw WRENCHLESS CHUCK

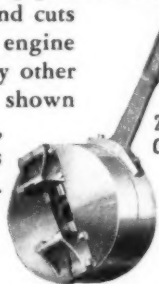
will pay for itself in 60 to 90 days on production schedules by giving MORE parts per hour at a LOWER cost per part. Most round parts can be set in the Barker Wrenchless Chuck without stopping the machine. It saves time, helps speed up production, is simple to operate, reduces operator fatigue and cuts spoilage where the run is continuous on turrets, engine lathes, cutting off machines, drill presses or any other type of chucking machine. The Barker Chuck shown above, replacing an ordinary 3-jaw chuck, jumped production from 18 to 24 pieces per hour. It can do it in *your* plant too. Let us show you how!

3 JAW
CHUCK



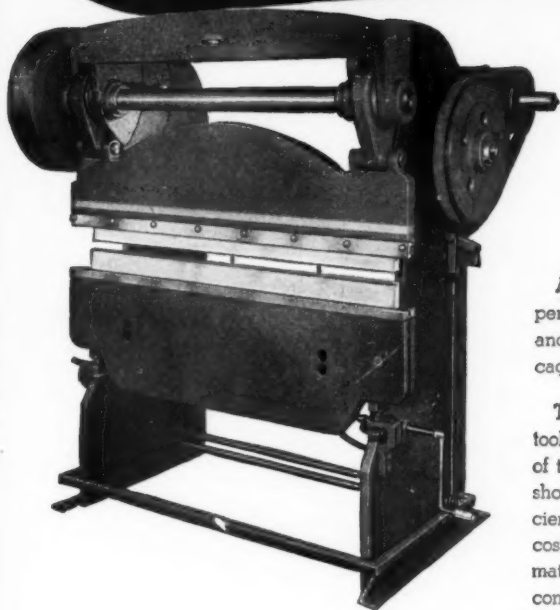
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2 JAW
CHUCK



Chuck Division
THOMAS HOIST CO.
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Powerful CHICAGO STEEL PRESS BRAKE



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A POWERFUL, rugged, inexpensive Press Brake, designed and built to the standards of Chicago Steel Forming Presses.

This money-saving production tool will handle 40 to 50 percent of the work done in an average shop. Greater speed, higher efficiency—much lower operating cost—plus the highest quality material and sturdy steel welded construction as in our larger machines.

—3 sizes—capacities 10 gage, 4 ft. long; 12 gage, 5 ft. long; 14 gage, 6 ft. long. Powered by 1½ h. p. motor.

We also build special machines for intricate bending operations.

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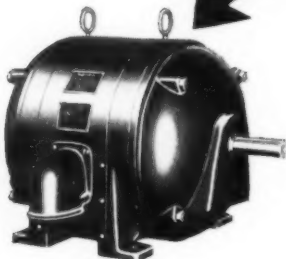
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POWER BENDING AND POWER PRESS BRAKES

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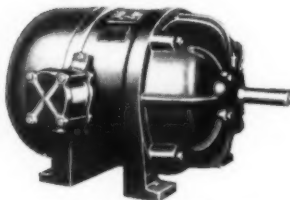
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HAVE TO BE**

GOOD!



DRIP-PROOF

LIMA Drip-Proof . . .
built for Industrial Applications requiring motor protection against failures caused by dripping liquids, flying chips, filings, etc., so prevalent in a production line.



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Built for Industrial Applications requiring motor protection against dust, cinders, silt, dripping or splashing liquids, etc.

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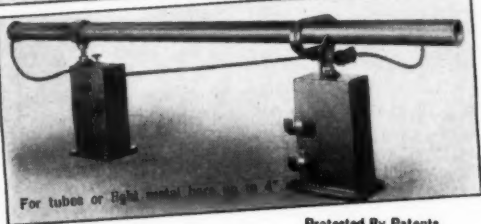
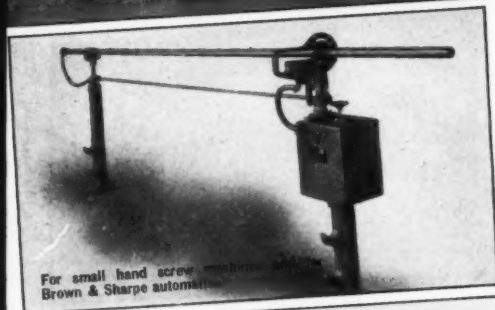
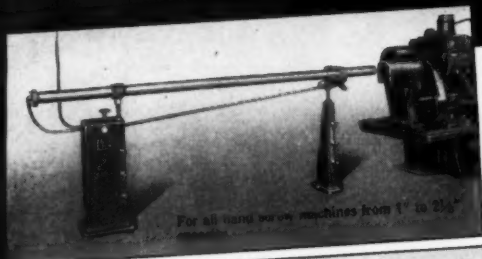
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LIMA PEDESTAL GRINDERS — LIMA ELECTRIC MOTORS



FEEDS AUTOMATICALLY

to the last possible remnant!



Protected By Patents

Special heavy-duty machine for bar stock and tubing up to and including 8" dia., in standard lengths.

WRITE US TODAY

for complete descriptions and engineering data on Lipe Bar Feeds. No charge.



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PNEUMATIC BAR FEEDS

Actually, the Lipe Pneumatic Bar Feed does every part of the feed job except to replace the bar. And does it easily, automatically, rapidly and safely.

Gets More Out of Your Machine

- Operates on any machine tool where stock is fed through a spindle or having a fixed stock stop.
- Feeds stock bar automatically into spindle.
- Reloads easily.
- Permits use of exact size polished stock to save additional operations.
- Saves on rejects due to scratching, marring.
- Eliminates end whip.
- Bar feeds for standard bar stock up to and including 2½" dia.; and lightweight bars and tubing up to and including 4" dia.
- Safe and fool-proof. Eliminates feed fingers, feed finger tube, and all other parts related to feeding in the screw machine.

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\$29⁵⁰
Only **\$29** prepaid
MONEY BACK GUARANTEE



Precision surface plates. Finest quality Hand Scraped. Manufactured by CHALLENGE MACH. CO. Original factory packing. 12"x18" with 1/2" thick plate, 3" ribs. Complete with durable wooden protective cover and wooden handles. Made to strict gov't. specifications. BRAND NEW! A buy you can't afford to miss.

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*Oxygen Regulators—HARRIS CALORIFIC. 400-3,000 lb. gauges.

*Acetylene Regulators—ALEXANDER MILBURN. 50-500 lb. gauges, commercial fitting.

Above at ONLY \$17. Pr. or \$9. Ea.

*Rego Acetylene Regulators—50-500 lb. gauges, commercial fitting, \$9.50 Ea.

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All prices F.O.B. Denver, Colorado.

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ASSOCIATED TRADERS, INC.

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Any Size Hole

Any Shape Hole

— in any Steel or Metal including Carbides
— with **ELECTRO-ARC Boring Machines**

**That's what this Sensational
Machine Will Do!**

● So new that the basic idea has been patented, Electro Arc Disintegrates broken Taps, Drills, End Mills, Reamers, Screws, Studs and the like—without heating or changing the temper of the metal.

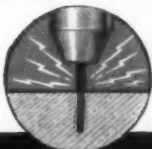
With Electro Arc, you cut any type or size of hole—from .040" to 1" and up in diameter, and in round, square, hexagonal, "U" or bar shapes.

Let us show you—

- How YOU can save valuable dies and castings with Electro Arc—
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Write for our pamphlet and detailed information today.

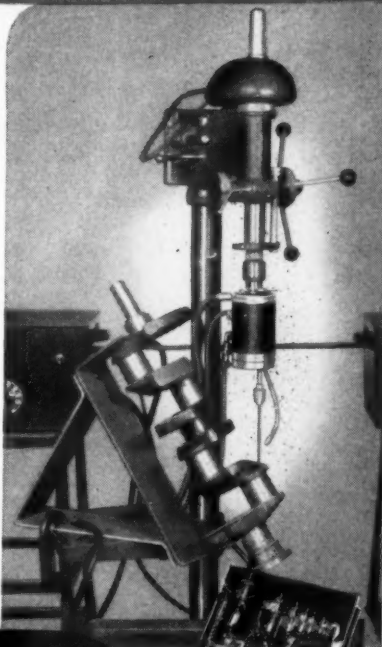
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ELECTRO ARC
Boring Devices



Write Today
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BROCHURE

TORIT DUST COLLECTORS



Help keep the shavings out of shaving

The manufacturer of a famous shaving cream was having trouble removing the dust, bits of paper, and other material found in jars as they came from the supplier. Costly hand methods were used until the ingenious unit at the left was set up.

In this operation jars move under a hood, where an air jet blows the foreign matter loose and into the suction stream of a TORIT No. 52 Dust Collector. Sterilizing is done at the same time, and the jars move directly to filling machines.

This installation shows the adaptability of TORIT Dust Collectors to unusual tasks. Compact and self-contained, they fit all production layouts and can be moved as necessary. Models for standard grinding, polishing and cut-off machines are available for immediate delivery. For details and the latest TORIT catalog, write:



Torlit Dust Collectors are self-contained units for carrying away dust-laden air around grinding, cutting and polishing wheels.

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Want real speed? *use*

JOHNSON
metal cut-off
BAND SAW

YOU GET MORE SPEED with the Johnson because of its greater stability, the exceptional rigidity of its three-point-supported, heavy bed, and equally vital, the vibrationless stiffness with which the saw is held to the work by its wide supporting guide rolls. All this simply means that the saw blade can be pushed harder, will last longer, and will cut more accurately and closer to tolerance, which in turn means a further saving in material and machining time.

Every important dimension in the machine is **GENEROUS**. Bandwheels, 16" diameter, give plenty of grip on the blade and cause mighty little twisting or bending

Big capacity—10"x18"
—all you need—

Automatic, hydraulic feed, quick adjustable from front of machine.

Quick-setting vise, operated from front of machine.

Stop for setting work, duplicating length cut-off.

Four motor speeds. Automatic shut-off at end of cut.

stress. Wheel axles are extra-heavy, with large auto-type roller bearings. Pivot bar is of extra large diameter. And the capacity of the machine, 10" high, 18" wide, covers just about every cutting-off need for any shop.

Made in two types—dry cutting for general work, wet cutting for high production. Casters for quick portability if desired.



Write now for the descriptive catalog, and the address of the dealer nearest you.

JOHNSON

MANUFACTURING CORP.
616 CHRYSLER BLDG.
NEW YORK 17, N. Y.

Make Quick, Accurate Adjustment

WITH **SCULLY-JONES**

ADJUSTABLE-ADAPTER-ASSEMBLIES

FAST and EASY as 1-2-3

- 1 Release set screw in the side of spindle.
- 2 Release screw in nut.
- 3 Shorten or lengthen projection by turning the nut.

SPINDLE EXTENSION ASSEMBLIES—Styles 1000 and 1900—Furnished with Morse Taper Holes and Acme Threads on the shanks.

TENSION AND COMPRESSION TAP HOLDERS—Styles "C" and "D"—Used on multiple spindle tapping heads to compensate for variations in lead of different taps.

CHOICE OF TAPERS—Adjustable adapter assemblies are furnished with Morse Taper, "USE-EM-UP" or Stub Taper Holes. Acme Threads or Standard "V" Threads on the shanks.

In multiple spindle drilling and tapping, save time and money; eliminate trouble and delays; adjust drills and taps fast and easy as One, Two, Three.

Set-up is not disturbed. Accuracy is assured as spindle screw retains the adapter in position, and key furnishes the positive drive. These adapters are carefully heat-treated and ground to assure concentricity.

For complete information refer to page 38, and 64 through 78 of Scully-Jones Tool Engineering Manual 500, or write for details.

MOST STANDARD SIZES ARE CARRIED IN STOCK FOR

IMMEDIATE DELIVERY!

Are You Planning **SPECIAL TOOLING**? If so, please send your drawings and specifications early. Prompt quotations will be made and delivery dates can be met, thus preventing delays in your production schedules.

Refer to the Scully-Jones Catalog showing over 500 types and sizes of cutting tools, roller chucks, boring equipment, lathes, etc.

Scully-Jones

AND COMPANY

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TYPICAL APPLICATION—of Scully-Jones Adjustable Adapter Type Assemblies. Close-up of work head and index table of a Special Multiple Spindle Machine, Manufactured by The Cross Co., Detroit, Mich.

2403



Hundreds of large die shops and industrial plants have found ACRO PULLERS indispensable for the grinding, mounting, and setting of punches. Notice there is no struggle to separate the die set. Acro's Indexed Screw Wrenches" lift the holder axially from the die shoe. The operator raises or lowers the die smoothly, safely, accurately . . . or he may hold it at any desired height. Time saving . . . money making.

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"Patented . . . Exclusively Acro.

**SAVE UP TO 50%
OF DIE-MAKING TIME!**

Raise punch holders straight up with no pounding, no prying, no damage to the set . . . no lost time.

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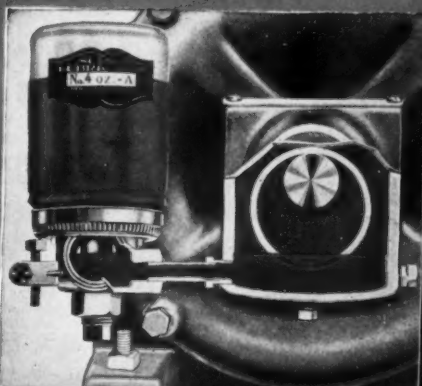
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PREVENT BURNED-OUT MOTORS

Authorities say 85% of all lubricating oils never touch the surface intended! No wonder repairs on 3 out of 4 machines are due to faulty lubrication. Save your equipment with ACRO LUBRICATORS. They feed oil to motor bearings automatically . . . no drippage, no waste, no overflow. Famous for "Dual Visibility"—sight glass shows exact oil level on bearing . . . reservoir shows oil supply. Eliminates guesswork.

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ACRO

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Say Users of **SUNNEN PRECISION HONING MACHINE**

Tool room users are enthusiastic about the speed with which they can precision finish internal diameters from .120" to 2.625". Many owners say the Sunnen Precision Honing Machine is as much as 10 times faster than hand lapping — and that accuracy and finish meet all their specifications. In addition, the overall cost of Sunnen Honing is much lower.

This machine is guaranteed to produce accuracy of .0001" and it is being used to hold tolerances within .000025" (25 millionths) in hardened steel. Finishes of 2 to 3 micro-inches can be produced.

Ideal for fitting dowel pins, ejector pins, die and jig bushings and for finishing ring gauges and extrusion dies.

Sunnen Tool Room Honing . . .

- Increases life of parts
- Set up for any size hole in less than 1 minute
- Corrects heat treat distortion
- Low in cost—economical to use

Write today for bulletin giving details—or we'll gladly send a Sunnen Engineer to your plant.



SUNNEN PRODUCTS COMPANY

7935 Manchester Ave., St. Louis 17, Missouri
CANADIAN FACTORY: CHATHAM, ONTARIO

Typical Examples:



Shell Loading Die.



Hardened steel ring gauge—finished to an accuracy of .000025" for roundness and straightness.



Sunnen precision honing to a highly polished finish increases wearing quality of these hardened steel drill jig bushings.



Drawing and Blanking Die "saves time in producing smooth base metal finish."

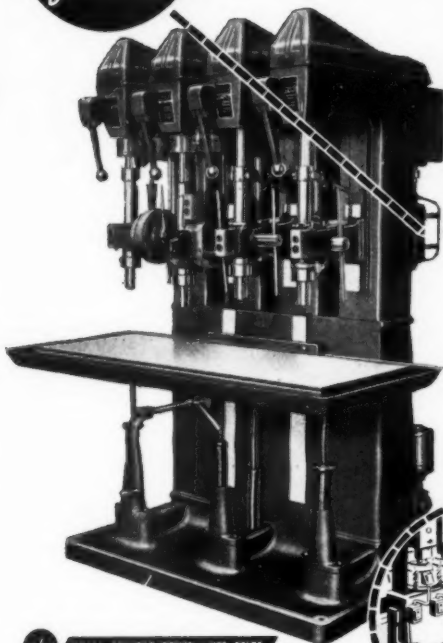


Rubber Eraser Extrusion Die "tripled life of extrusion dies."

308

Avey's
PLUS
features

add up to **TOP PRODUCTION**



Each spindle of AVEY BMA-6 is individually motor-driven by standard frame constant speed motor. Foot-mounted motor easily interchanged or replaced. Standard motors can be stocked.

AVEY TYPE BMA-6

Four Spindle—12" Overhang

1st spindle—Avey-matic feed

2nd spindle—Plain power feed

3rd spindle—Hand feed

4th spindle—Tapping (reversing motor)

plus FINAL SPINDLE DRIVE—VEE BELTS

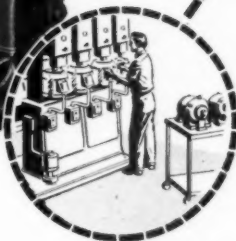
Yes belt end on final drive from gear box to spindle. Increases speed and sensitivity in drilling. Carries full horse power from motor to job.

plus SIX SPEED CHANGES

On the AVEY BMA-6 six speed changes are made through selective, sliding gears. This automatic type of gear shift is controlled by a simple lever at front of machine. Provides versatility and effective operation.

plus SPEEDS OBTAINED—SLIDING GEARS

Selective, sliding gears of AVEY BMA-6 change speeds quickly and easily. Each gear is manufactured and finished by accurate, modern process, shaved, hardened and lapped. Insures smooth operation and long performance.



Single to six spindle machines, equipped with hand feed, power feed or reversing motor tapping.



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RIVETING • PRESSING
PUNCHING • PIERCING

FOR prompt, dependable help in getting tooled up for efficient production, use Hannifin "Hy-Power" Hydraulic Units.

COMPLETE LINE—Portable and stationary types. Standard and special designs available for riveting, pressing, punching, piercing, crimping. Capacities to 100 tons; reach to 6' or more.

FAST—Time cycle for standard riveters ranges from $1\frac{1}{2}$ seconds to 3 seconds for 3" or 4" stroke units.

EFFICIENT—More work with less effort, no noise. Easy to maintain high production rates. Low power costs. Every operating convenience.

PUSH BUTTON CONTROL—A single push button gives you complete control. Hold button down and riveter goes through one complete cycle automatically: rapid advance stroke at low pressure . . . short power stroke at full pressure . . . automatic return to starting position. Hannifin "Hy-Power" units come to you complete with automatic hydraulic pressure generator — **READY TO GO TO WORK.** Ask for recommendations.

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PNEUMATIC PRESSES • HYDRAULIC RIVETERS • AIR CONTROL VALVES



RED TANG FILES CUT MORE METAL

**...more easily
...give you CONSISTENT
CUTTING EFFICIENCY**



TOP HANDS know the file that gives them the best and quickest results for the effort they put into the work. It's a "Red Tang" File every time. For this is the file with the teeth shaped like those of a metal-cutting saw . . . teeth that cut instead of scrape . . . teeth that take off more stock per stroke, rolling it off in coiled chips, like a lathe-tool.

Here's top value for your file-dollar. Simonds makes "Red Tangs" in top grade *only* . . . and that's the only grade of work you get from them. Tell your Distributor you want "Red Tangs" on your next order. Then check the difference in your production.



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NO. 211 DIAL INDICATOR

FOR GREATER PRODUCTIVITY

You'll find this AMES No. 1 DIAL COMPARATOR a great aid in meeting your increased production schedules. It's *accurate*, first,—but *ease*, *impersonality*, and *speed* in measuring are also very evident. And they'll all be evident for thousands of readings—contributing low-cost maintenance to low initial cost—giving you highest quality measuring with the greatest possible economy—in dollars, time and human effort.

Ames indicators in any size or dial graduation may be attached. The No. 211 shown is graduated in .0001", has dial reading 0-5-0, and a range of .025"

Specifications

Capacity under contact:	2"	Height, overall:	9½"
Table diameter:	2"	Throat, contact to column:	1½"
		Weight:	4 lbs.

For information on our full line of Comparators and many other measuring instruments, address our Home Office:

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B. C. AMES CO.

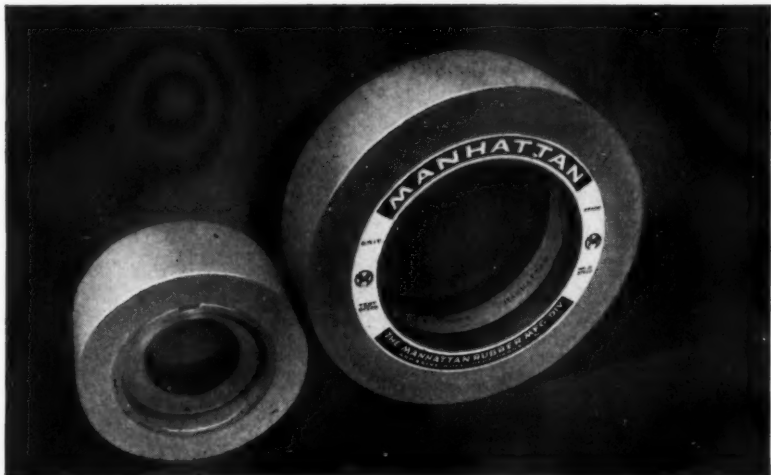
Mfr. of Micrometer Dial Gauges

Micrometer Dial Indicators

*Representatives in
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MANHATTAN RUBBER BONDED CENTERLESS WHEELS



HEAVY STOCK REMOVAL—ROUGH and FINISH with same wheel

Data from Test Files and Engineering Reports—Thru-Feed with 20" x 6" x 12" Wheels

Material	Hardened Steel Pins	Stainless Steel Bars	Soft Steel Bars	Shelby Tubing	Cast Iron Rolls
Size	1/4" to 1" dia. 4" to 6" long	.040/.400" dia. Mill lengths	3/8" to 5/8" dia. 10' to 20' long	1 1/2" dia. 3' to 5' long	5/8" to 3/4" dia. 4" to 8" long
Passes and Removal	3 Passes 1st .006/.008 2nd .0035 3rd .0015	2 Passes 1st .010/.012 2nd .002/.003	2 Passes 1st .021/.023 2nd .005/.007	3 Passes 1st .005/.006 2nd .003/.004 3rd .002	2 Passes 1st to .070 2nd to .011
Hold Size	+.0001 -.0000	.0015 Taper 12' Bars	Very Well	Good	Good
Finish	Excellent	1st Pass Commercial 2nd Pass Polish	Good Commercial	Very Good	Fair
Specifications	4660 F15 KLE	80100 Q52 BV5	4660 F58 BV9	6080 Q85 KLE	3646 F578 KLE

REGULATING WHEELS—PLAIN—CORE MOUNTED
MANHATTAN CORE MOUNTINGS EFFECT SUBSTANTIAL SAVINGS



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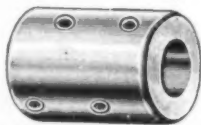
Yes!—they're all

Chicago DIE CASTING Stock Items

The castings displayed on this page are just a part of our Stock Line. You save time and money when you use Chicago Castings.

Make our factory your headquarters for your casting requirements.

For complete information write for CATALOG No. 46

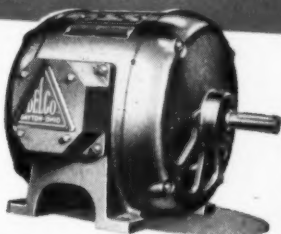


Chicago DIE CASTING MFG. COMPANY
2512 West Monroe Street, Chicago 12, Illinois

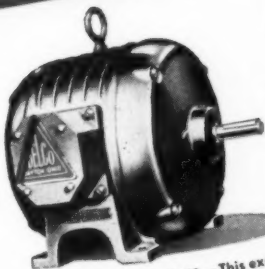


DELCO

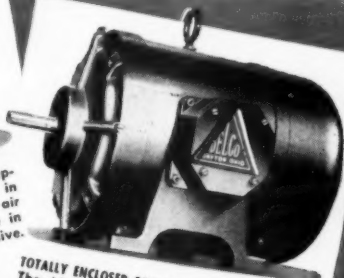
*The Motor
to
Do the Job*



OPEN FRAME BALL BEARING—This frame is compact, rugged, and allows a large volume of cooling air to flow through the motor. The accessibility of all parts makes this type motor popular with maintenance men. It has proved most satisfactory for general popular applications where dust and dirt are not important factors. Now available in frame sizes 203 through 365 inclusive.



TOTAL ENCLOSED BALL BEARING—This exceptionally strong frame is desirable in locations where dust and dirt in the air cannot be controlled. Now available in frame sizes 203 through 225 inclusive.



TOTALLY ENCLOSED FAN-COOLED BALL BEARING—The ideal motor frame to protect motor windings and rotating parts in atmosphere laden with injurious particles—iron dust, foundry sand, etc. This type now available in frame sizes 204 through 505 inclusive.



For additional information on Delco Motors,
write to Delco Products for complete data.

DELCO MOTORS

DIVISION OF GENERAL MOTORS CORPORATION, DAYTON, OHIO

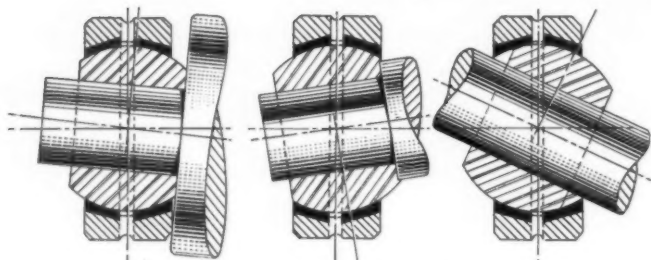
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*Correction of misalignment is
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The day of competitive production is here, and you can meet that competition by planning your machines to include this new idea in spherical bearings and rod ends. Using one ball instead of a double row of balls in a race, cost is kept at the minimum, and heavier loads can be carried without breakage. A decided improvement in bearings whether applied to rod ends or used alone.

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THE HEIM
FAIRFIELD



COMPANY
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INTERESTED IN A 300% INCREASE IN STAMPING PRODUCTION USING YOUR PRESENT PRESSES



*Photo courtesy of
Federal Tool Corp., Chicago, Ill.
Designers and builders of
9 Station Progressive Dies*

**THEN INSTALL
ONE OF THESE
NEW, LOW-COST
DICKERMAN
DIE FEEDS**

THIS IS NO FAIRY TALE. Dickerman Die Feeds are actually increasing production 300% or more in many shops. They will do the same for you, used on your present punch presses.

IN ADDITION, they reduce operator hours 80 to 90 per cent, due to their accuracy, reliability, versatility. They increase die life through elimination of costly jams and crack-ups—can be attached to any Press.

THESE FIGURES ARE FACTS, so why look further? Replace worn punch press feeds **NOW** with the new improved Dickerman Die Feeds. Send for free illustrated catalog **TODAY.**

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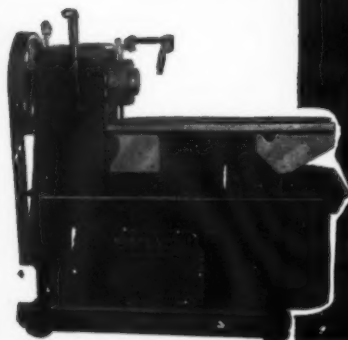
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for LOW COST PRODUCTION with inexperienced Help

Start with
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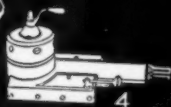
and ADD THESE ACCESSORIES



1 CROSS-SLIDE:
Hand screw feed.



2 CROSS-SLIDE:
Rock and pinion feed.



3 CARRIAGE:
With manual or power
feed, 3 lengths to 18'

4 TURRET:
6 station flat type, with
hand or power feed.
Many other standard or
special attachments avail-
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Does high labor make your production costs a problem? You can save on both first cost and operating cost with the Minneapolis Production Lathe, which is easily handled by inexperienced help. Under our "Basic Units & Parts" plan, you order only the equipment needed for your particular job. 14" swing, heavy duty spindle assembly. 2 1/4" round bar capacity. Send sample part or drawing, and we'll quote you on a Minneapolis lathe "tailor made for your work."

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— at no extra cutter cost



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64.9%
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INCREASE IN
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Actual performance tests of "SUPERITE"-Treated Cutters in customers' plants are shown in the accompanying figures.

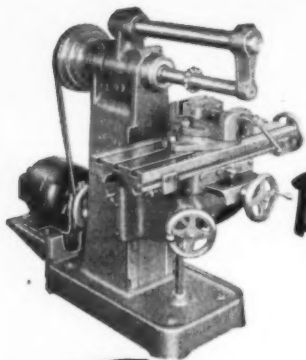
"SUPERITE"-Treated Cutters represent a substantial saving in that they produce a greater number of gears per sharpening, and per total cutter life... resulting in an overall saving of productive machine time.

The process is exclusive with Fellows, performed only at our plant in Springfield, Vermont. Arrangements can be made, however, for cutting tests in your plant. Contact our nearest office.

Fellows

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BENCHMASTERS"



*"It's a power house
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"Our Benchmaster really hogs off the metal on both vertical and horizontal milling operations. It's easier to use and far more economical on all of our smaller operations."



*"Saved my neck on
a grinding job"*

"We used our Benchmaster Vertical Head to grind a relief in the bore of a special part. The job was a complete success and we saved our neck."

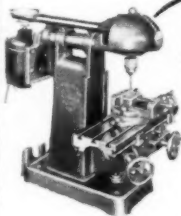


*"We're face turning
with ours"*



"Using a Benchmaster for light lathe work is swell. We even do boring work on jobs too large for our regular lathes to swing."

*"I use mine as an
extra drill press"*



"Benchmaster's No. 2 Morse Taper is extra handy because we can use our regular lathe tools. I use my Benchmaster for a lot of drilling as well as milling."

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Get a BENCHMASTER—the all-around machine that earns its keep 5 ways!

benchmaster

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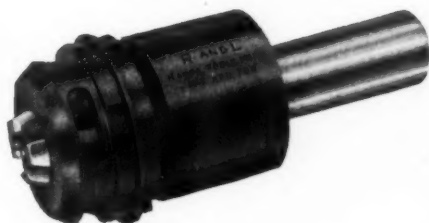


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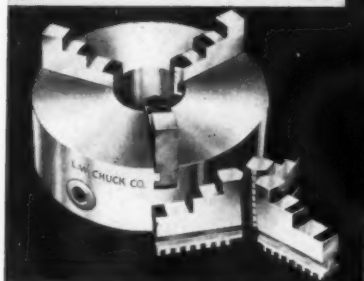
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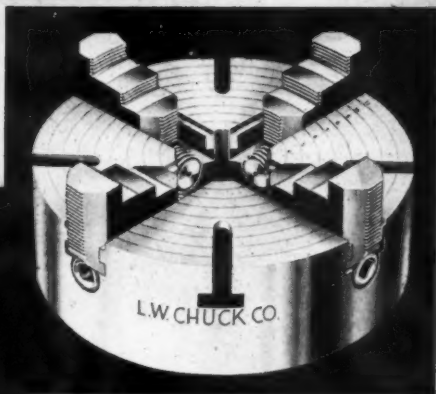
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Accurately cut ground and filed, hardened
steel, reversible jaws, unusually
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3-JAW UNIVERSAL LATHE AND SCREW MACHINE CHUCK



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6 1/4" \$45.00 7 1/2" \$55.00 10 1/2" \$92.00

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Send for complete catalog giving prices and specifications on these quality, low-cost L-W Products



L-W CHUCK COMPANY

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*This NEW,
IMPROVED line
will help you...*



**for
PUSHING PULLING LIFTING
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in any direction**

For Product
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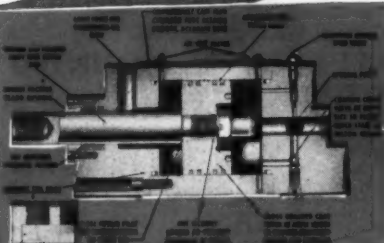
"LOGAN" ROTOCAST HYDRAULIC CYLINDERS

Take advantage of the new, modern-design ROTOCAST Hydraulic Cylinders... get fast-acting, positive, controlled power for many industrial applications. Clean, true bores in centrifugal-cast cylinder barrels result in a full, smooth, uniform power flow and lasting accuracy. Soft synthetic "O" ring seals are permanently leak-proof. No gaskets... no tie rods.

Standard ROTOCAST Cylinders are available in sizes from 2" to 8" bore, with any length of stroke up to 8 feet. 4 piston/rod end types. For operating pressures to 1500 p.s.i.

OIL OR WATER SERVICE—Designed primarily for oil service, Logan Hydraulic Cylinders can also be used for water service if the water is treated, or the cylinders are made from special material.

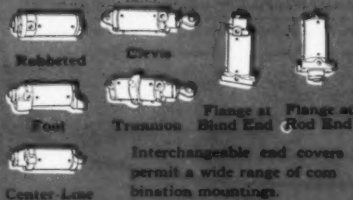
FREE ENGINEERING ADVICE—Ask for recommendations on hydraulic cylinders and circuits. No obligation



THESE ROTOCAST FEATURES INSURE MORE EFFICIENT PERFORMANCE:

- Clean, accurate cylinder bores—honed to a mirror finish—assure smooth, full power flow
- Dimensional accuracy retained for life of cylinder by centrifugal-cast barrel.
- Automotive-type piston rings and smooth bore minimize friction and leakage
- "O" rings provide permanent, leak-proof seal between barrel and end covers.
- Cushioned one or both ends if desired.
- Standard ratio, 2:1 differential and double-end piston rods

7 STANDARD MOUNTING TYPES



(Right) Hydraulic piercing press made with 4 ROTOCAST Cylinders to perform the piercing operation.

NEW CATALOGS

Write for your copy of this new free catalog on Logan ROTOCAST Hydraulic Cylinders.



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SAVES
* TIME
* EFFORT
* MOTION

Air and Hydraulic Equipment

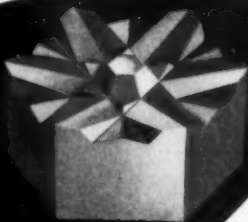
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CHUCKS • CYLINDERS • VALVES • PRESSES • FLOW-COOLANT PUMPS



60 DIFFERENT FACETS



YET

THE PIECE WAS MOUNTED ONLY ONCE



Illustrative of the unusual flexibility of the Hendey 12" Shaper, the piece pictured above, was finished after being mounted *only once* in the shaper's vise. The operator took advantage of the universal table and made six different cuts to form an ordinary hexagon bar into an intricate shape with sixty facets.

But this is only one of several features inherent in the Hendey 12" Shaper. Production-wise you'll be able to remove metal at the rate of 182 feet per minute on a 6-inch stroke, with a vibrationless action that permits the highest degree of accuracy on fine tool and die work. Operation is simple and can be accomplished, through dual controls, from either side of the machine.

Offering performance hitherto unapproached in facility of operation, high rate of production and accuracy of work, the Hendey 12" High Speed Universal Crank Shaper is a machine you should investigate. Write today for catalog giving complete details.

The Hendey Machine Company

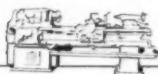
Main Office and Plant — Torrington, Connecticut

Offices — N. Y., Chicago, Boston, Detroit, Rochester, Los Angeles, San Francisco

Representatives in — Philadelphia, Cleveland, Pittsburgh

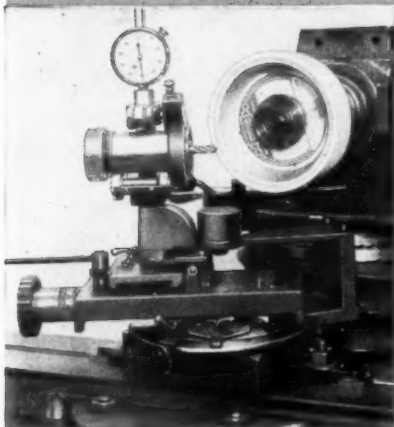
Hendey

TOOL ROOM LATHES
12" - 14" - 16" - 18" - 20"

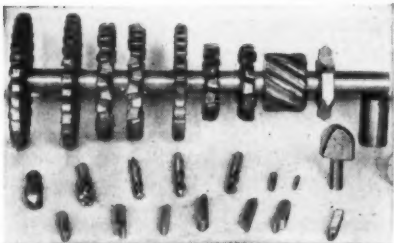


SHAPERS
12" - 16" - 20"

BETTER THAN ASPIRIN FOR GRINDING ROOM HEADACHES!



PATENT PENDING



Here are a few standard cutting tools that have been ground on the Radiform into special forms.

The Radi-Form is a small grinder attachment — the secret of which is that IT CAN MOVE THE WORK IN A PREDETERMINED ARC OF ANY DESIRED RADIUS. (From $1/16$ to 2" concave, and from .00 to 2" convex.)

This means that you can now form spiral fluted end mills and similar rotary cutting tools to within .0005 accuracy if desired. You can generate radii on carbide tipped cutting tools WITHOUT FIRST FORMING A WHEEL. A standard cupped diamond wheel will serve for all your tricky grinding problems.

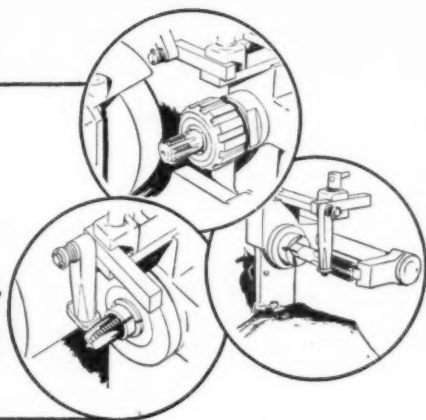
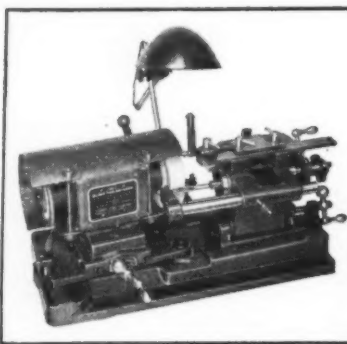
Here is unbelievable accuracy coupled with unheard of ease... cutting tool grinding made simple, quick and accurate. The Radi-Form can also, with ease and accuracy, pre-form grinding wheels for plunge grinding.

The Radi-Form grinder attachment sells for a surprisingly low price and earns its keep in a hurry. Write for literature and prices.

W. F. MEYERS COMPANY • ESTABLISHED 1888

1014 FOURTEENTH STREET • • • BEDFORD, INDIANA

Model No. 1 for taps up to 6" long
Model No. 2 for taps up to 14" long



IF YOU TOO, THINK A TAP GRINDER SHOULD . . .

Be not only **ACCURATE**: Grind an accurate chamfer angle, with accurate and uniform relief, but also, be

VERSATILE: The one head on the one machine should grind both right-hand and left-hand taps. Grind taps with 2, 3, 4, 5, 6, 8 and 10 flutes. Grind taps as small as No. 0, and as large as 2½" diameter. Hold taps on centers, on the shank, or on the O.D. of the thread. Be used for many other jobs requiring relief on the point.

EASILY OPERATED: Simple to set up. Tap revolved by turning a crank, the same motion you use in sharpening a pencil. Unskilled help can be taught quickly to do an excellent job.

SPEEDY: GRIND ALL THE LANDS IN VERY RAPID ROTATION—removing a small amount of material at each revolution, without burning and spoiling the temper—because of perfect utilization of air cooling.

REASONABLY PRICED: Because you want to show a profit through its use. IF YOU, TOO, THINK A MODERN TAP GRINDER SHOULD DO AND BE ALL THESE THINGS . . . We suggest that you find out more about THE BLAKE TAP GRINDER . . . The only Tap Grinder on the market that can give you all these tap sharpener requisites. Simply send us the coupon below.

Please send me complete details on
The Blake Tap Grinder.

H.

NAME _____ TITLE _____

COMPANY _____

STREET _____

CITY _____ STATE _____



BLACK DIAMOND PRECISION DRILL GRINDERS • BLAKE TAP

GRINDERS • BLAKE FLUTE GRINDERS • WALTHAM CUTTER SHARPENERS •

WALTHAM THREAD MILLERS • AMERICAN TOOL HOLDERS • SURFACE FINISH STANDARDS

**YOU have answered
the long-felt need for
a SMALL PRESS that does a**

**BIG
JOB**

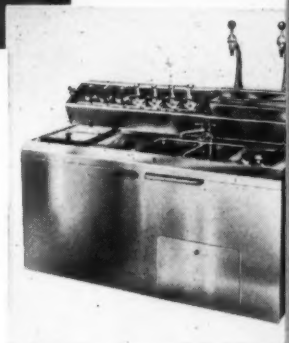


**ACE SODA FOUNTAIN
USES A KRW 100-TON
PRESS TO BLANK AND
FORM STAINLESS STEEL
TAPS . . . RELEASING
LARGER EQUIPMENT
FOR OTHER WORK.**

Ace Soda Fountain says further—"We are well satisfied with the performance of your model 37V Hydraulic Press. Its versatility, in the various blanking and forming operations which we do, exceeds the claims made in your specifications."

INDUSTRY HAS PROVEN that, on a large percentage of average blanking and forming work, large, heavy-tonnage presses, with their high initial and operating costs are unnecessary. The experience of many KRW users has demonstrated this fact beyond any doubt. KRW Hydraulic Presses are highly adaptable . . . they are available in sizes from 25 to 100 . . . in varying bed widths and lengths. Because they are hydraulically operated and not mechanically driven, they are extremely quiet and vibrationless in operation. First cost is very low, operating costs are still lower. In one instance, the purchase price of a KRW Press was less than the foundation cost of heavier equipment originally planned.

Let us know your needs, we'll show you how to save money in a big way. Deliveries in 8-10 weeks on large presses, one week on standard presses.



Many parts of this Ace Soda Fountain, including taps, are blanked and formed on the KRW Press.

TELL US YOUR NEEDS! MAIL COUPON TODAY!

K·R·WILSON

K. R. WILSON, 215 Main St., Buffalo 5, N. Y.

Please send complete information on New KRW 100-ton Hydraulic Presses.

Name

Address



How **TOUGH** must a **GRINDER** be?

TOUGH enough:

1. To remove hard metal.
2. To operate continually at maximum grinding efficiency.
3. To withstand rough handling.
4. To keep out all dirt.
5. To never burn out.

These tough, hard to meet grinding requirements are met by Ingersoll-Rand Air Grinders with speeds as high as 20,000 rpm . . . with a sensitive governor or speed regulator that permits operation of the grinder at its most efficient speed, and also prevents overspeeding . . . with rotor bearings sealed against the entrance of dirt . . . with cool running, multi-vane motors that will never burn out.

Light-weight I-R Air Grinders have balance for smooth, vibrationless operation and an automatic oiler for continuous lubrication of the entire motor assembly.

Take advantage now of Ingersoll-Rand Air Grinders. Just call our nearest branch office . . . or write for our Air Tools Bulletin.



AIR TOOLS
COMPRESSORS
CONDENSERS
TURBO-BLOWERS
CENTRIFUGAL PUMPS
OIL & GAS ENGINES

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

233-B

• 7200 stainless steel stampings per hour—

• tolerances held within 0.002" —

...using

DANLY

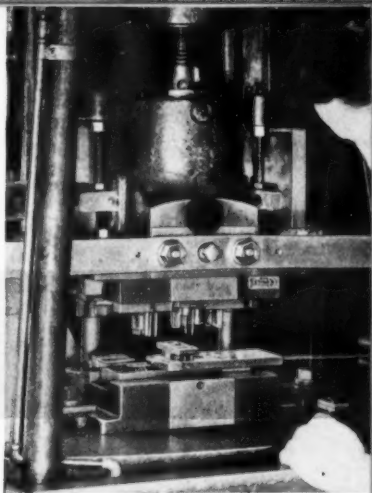
STANDARD PRECISION DIE SET

Sustained operating precision of die set reduces die wear...produces 200,000 stampings per grind

Inherent accuracy in Danly Die Sets permits taking full advantage of the die maker's precision under actual press operating conditions. As a result, close tolerances may be held and tool life is substantially increased.

In the stamping operation shown, stainless steel parts for electrical instruments are pierced, formed and blanked in an intricate progressive die. Tolerances are extremely close, and finished parts must pass rigid gage inspection.

Stampings are produced at a rate of 120 per minute. At



this high speed, a tolerance of 0.002 in. is held on in and outside diameters and the distance between the arms. Danly Die Set accuracy is a major factor in maintaining punch-and-die relation, resulting in production of 200,000 parts between grinds.

DANLY ENGINEERING SERVICE—Use Danly Die Sets to insure same close precision, high production and long die life on all of your press work. Consult our Engineering Dept. for helpful recommendations on die sets—large or small, standard or special—for any type of press operation. (No obligation.)

DANLY

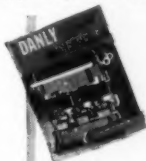
NATION-WIDE

★ ASSEMBLY SERVICE



Danly offices in 10 key cities give immediate attention to your orders. Assembly plants (marked with stars) stock interchangeable parts for quick delivery of any standard die set to your specifications.

- ★ Chicago 50, 2100 S. 52nd Ave.
- ★ Cleveland 14, 1550 E. 33rd St.
- ★ Dayton 2, 900 E. Monument Ave.
- ★ Detroit 16, 1549 Tenale Ave.
- ★ Grand Rapids, 113 Michigan Ave., N. W.
- ★ Long Island City 1, 47-28 37th St.
- ★ Los Angeles 54, Ducommun Metals & Supply Co., 4800 S. Alameda
- ★ Milwaukee 2, 111 E. Wisconsin Ave.
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bulletin

Write for this informative bulletin indicating the nature of your requirements.

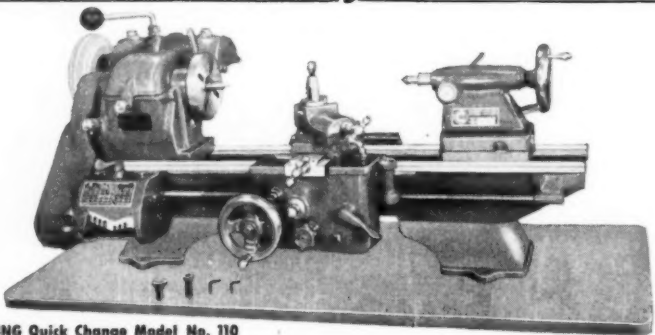
DANLY

DANLY MACHINE SPECIALTIES, INC.

2100 SOUTH 52ND AVENUE CHICAGO 50, ILLINOIS

PRECISION DIE SETS...STANDARD AND SPECIAL

Clausing LATHES



CLAUSING Quick Change Model No. 110

Swing over bed—12"

Swing over carriage—7½"

Distance between centers—24"

Accuracy THAT "STAYS PUT"

Exacting users prefer CLAUSING Lathes because of their adaptability, convenience, and sustained accuracy even after years of service.

CLAUSING Lathes are precision built for precision work. The bed is a solid close grained gray iron casting made rigid by inverted U and box braces. All beds are rough milled, seasoned, then rough and finish ground. Vee and flat ways are machined to within .001 inch of parallelism. Husky carriage is gibbed both back and front to prevent climbing and insure maximum rigidity. Bearing surfaces on cross slide, saddle, and tailstock are checked for close contact not just the high spots which may check accurate but quickly wear out of alignment. Compact headstock with built-in countershaft is a single streamlined unit guaranteed to within .001 inch of absolute accuracy.

CLAUSING Lathes roll smoothly on adjustable Timken tapered roller bearings—plenty of extra stamina for high speed and end thrust. Final machining of spindle is done with the spindle running on its own bearings, assuring concentricity.

Before you buy—investigate CLAUSING for economy, convenience, and accuracy.

Write for Literature

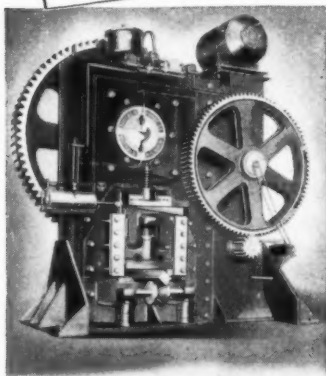
CLAUSING MANUFACTURING CO.
231 RICHMOND AVE. OTTUMWA, IOWA



FOR LOWER MANUFACTURING COSTS

Saving Money on these **BILLET SHEARING JOBS!**

- In a steel mill—Cutting hot slabs leaving finishing roll—Continuous production.
 - Automotive plants—Shearing high tensile valve stock at very high rate.
 - Forge plant—Shearing square hard billets for crank and axle forgings.
 - In a bar-mill—Shearing high tensile twisted bars.
 - In a brass mill—Shearing rolled slabs and cast ingots.
- ... And many others!



This No. 17 Buffalo Billet Shear stands nineteen feet high and weighs 175,000 pounds.

BUFFALO BILLET SHEARS

Above are a few of the ways "Buffalo" Billet Shears are cutting costs in shops today, in many cases on punishing 24-hour shifts.

The "Buffalo" No. 17 Shears, at left, cut SIX 10" round billets a minute — SIX 9" squares — SIX 8 x 3/4" flats. Eleven standard sizes. Write for Bulletin No. 3295-A. See how you can cut more billets—cleaner and cheaper.

BUFFALO FORGE COMPANY

388 Broadway

Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

**MACHINE
TOOLS**

by

Buffalo

- ★ BACK SPOT FACERS
- ★ BAR CUTTERS
- ★ BENDING ROLLS
- ★ BILLET SHEARS
- ★ DOUBLE END PUNCHES AND SHEARS
- ★ LOCOMOTIVE SHEARS
- ★ MILL TYPE SHEARS
- ★ RAPID ACTING PUNCHES
- ★ SINGLE END SHEARS
- ★ SPRUE CUTTERS
- ★ STRUCTURAL IRON WORKERS
- ★ UNIVERSAL IRON WORKERS
- ★ DRILLS FOR THE PRODUCTION LINE — DRILLS FOR THE TOOL ROOM

CONTINUOUS SERVICE — FASTER OPERATION — PEAK ACCURACY

BARNES

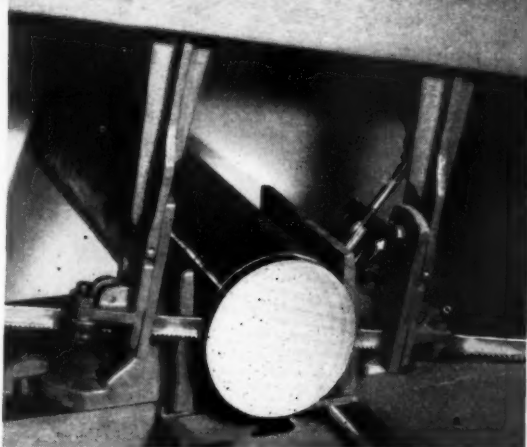
METAL
CUTTING

BAND SAWS

LOWER COSTS

OF MISCELLANEOUS
AND PRODUCTION
SAWING

ON YOUR
METAL
CUT-OFF
BAND SAW



BARNES BAND SAW BLADES are made of carefully selected steel . . . have perfectly milled teeth and even tooth set . . . are expertly heat treated . . . and produced by specialists with years of saw-making experience. All these factors result in a blade that definitely **LOWERS COSTS** and pays you extra dividends in more efficient performance.

Prove this statement—specify Barnes Band Saw Blades for your next sawing job! Your distributor can offer many worthwhile sawing suggestions and help you select the Barnes Blades of correct type and tooth specifications best suited for your particular cut-off operations. Call him today!



ESTABLISHED 1919

W. O. BARNES CO., INC.

DETROIT 14, MICHIGAN

GORTON Duplicators Give You

Production Plus . . .

Lower "Short Run" Costs

Gorton Duplicators are highly versatile and are designed for profiling and duplicating all kinds of dies and molds for plastics, rubber, glass, drop forging dies, metal patterns, die casting dies. They are precision built to handle either production assignments or short runs.

For example, the Jacobson Manufacturing Co. of Racine, Wisconsin had a small quantity of piston heads reshaped to a complicated design for the purpose of reducing compression. These were for small gasoline engines. To do this by conventional methods, would have taken several hours per piece. The time per piece on the Gorton was less than 20 minutes . . . (See Job Facts) . . . and each was an exact duplicate in shape and dimensions — an important requirement in this case.

Gorton equipment may save you money. Write for free Bulletin 1655 — see coupon below — or inquire about Gorton Engineering Service.

JOB FACTS!

JOB "Short Run" duplicating of piston head shape
 MATERIAL Aluminum Alloy
 MACHINE Gorton Duplicator with Tracer Control
 CUTTERS $\frac{3}{8}$ " Tung-carbide shaped to fit angles of master; 2 flute
 SPEED 4560 R.P.M.
 NO. OF PIECES 20
 SET-UP TIME 4 hours
 TIME TO FINISH 6 hours (all 20 pieces)
 REMARKS Minimum hand work required. Same cutter and stylus used throughout. Dia. of pistons 2". Max. depth of cut 15/32".



GEORGE **GORTON** MACHINE CO.

Tracer Controlled Milling

1406 RACINE STREET, RACINE, WISCONSIN, U. S. A.

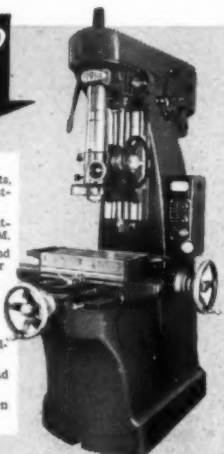
Please Send Without Obligation
 Bulletin No. 1406 - 1655

Name.....
 Company.....
 Position.....
 Address.....
 City..... State.....

Have you seen the new, larger Moore Jig Borer?

**WITH
ALL THESE ADDED
FEATURES**

1. Increased capacity and size—heavier cuts, larger holes—up to 3" in mild steel or cast-iron.
2. Infinitely variable spindle speeds, push-button controlled: range from 90 to 2400 RPM.
3. Three power feed ratios, .0015", .003", and .006", per revolution of spindle in either direction.
4. Centralized control panel and tachometer for spindle speeds and 1-shot lubrication.
5. Disconnect clutch for easy indicating.
6. Satin chrome finish on all dials and handwheels eliminates glare and rust.
7. Trip mechanism prevents jamming of lead screw nuts through over-travel.
8. Totally enclosed drive mechanism—no open belts or sheaves.



All the time-proven advantages of the Moore Jig Borer's accurate lead screw principle of hole location have been engineered into the new Model No. 2 to meet the popular demand for a similar machine of larger capacity, plus the added features above.

Like its smaller companion model, the No. 2 requires no size blocks or end measures, yet assures consistently accurate table settings within .0001". A turn of the micrometer dials guides the work to precise location rapidly. All holes in the workpiece can be spotted, drilled, bored or reamed consecutively, by coordinate location, and with minimum tool changes.

See what this quick-starting system of hole location means to your operators—how it eliminates the time-consuming methods of stop-and-start to change tools at each hole.

SPECIFICATIONS	
Table working surface	10" x 19"
Table travel longitudinal	16 1/2"
Table travel crosswise	10 1/2"
Table top to spindle end	min. 3" max. 18"
Vertical adj. quill housing	10"
Spindle quill travel	8"
Spindle center to column ways	16"
Spindle cen. to col. below ways	11 1/2"

Send for descriptive literature

With the Moore Jig Borer and Jig Grinder, coordinate calculations made by engineering department are used throughout in boring and finish-grinding to figures instead of to "fit." Soft and hardened parts are made concurrently, not progressively. Errors in hardened parts are corrected, not retained and transferred.

Both machines inspect own work without disturbing set-up.

MOORE SPECIAL TOOL CO., Inc.
728 Union Ave., Bridgeport 7, Conn.

**WRITE TODAY FOR COMPLETE LITERATURE
ON THESE MACHINES**

**Available Immediately!
to promote interchange-
ability in your toolroom**



**MOORE NO. 1
Model Jig Borer
remains in
the line...**

For its range—table working surface of 10" x 18" and cuts up to 3 1/4"—this machine with 1,000 satisfied users is still an ideal buy and will be continued to be offered for the many situations where a small, accurate jig borer fills the required prescription.

**MOORE
Jig Grinder
mechanically
relocates and
finish-grinds
holes in
hardened
parts to .0001"
in 1/2 the time of
other methods**



The Moore Jig Grinder eliminates hours of checking on the bench and surface plate to correct holes in hardened parts. No toolmaker's buttons or locating plugs are necessary, for this unique machine through the use of built-in lead screws mechanically relocates and finish-grinds straight or tapered holes in 1/2 to 1/4 the time required by conventional methods.

**Have you bought
your copy of
"Precision Hole
Location"?**



Over 5,000 copies of this valuable book on tool-making practices have been sold to date. Available at special price of \$3 in U.S.A.; \$3.50 outside U.S.A. 448 pages, over 400 illustrations. 184 pages of Woodworth Coordinate Location Tables from 3 to 100 holes. Send check or money order to Moore Special Tool Co., Inc., Bridgeport 7, Conn.

Add a MOORE to YOUR TOOLROOM

JIG BORERS • JIG GRINDERS • PANTO-CRUSH WHEEL DRESSERS
DIE FLIPPERS • COMPLETE LINE OF HOLE LOCATION ACCESSORIES

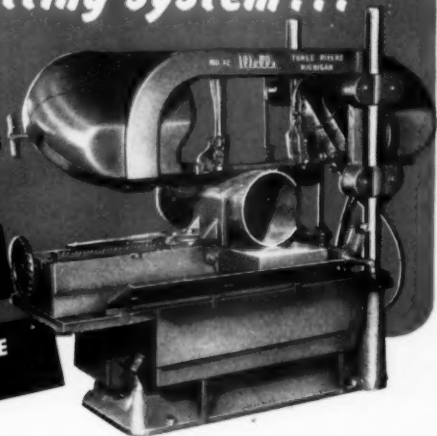
*Now available with
wet cutting system...*

the
**WELLS
No. 12
METAL CUTTING
BAND SAW!**

featuring

**AUTOMATIC CUTTING
CYCLE...**

**and
CONTROLLED BLADE
PRESSURE**



The heavy duty, hydraulically operated Wells No. 12 Metal Cutting Band Saw, with automatic cutting cycle and special blade pressure controls, is now available with a NEW time and money saving extra—the Wells wet cutting system. This complete self-contained system permits safe use of higher f.p.m. cutting speeds and increases blade efficiency. Installed as an integral part of the saw, the system includes chip pan, fluid tank, centrifugal type pump unit, screened intake splash guards, and flow control valve. Ask your Wells Saw Dealer for full information or write direct to the factory.

WELLS
The name of quality in tools

Wells

Products by Wells are Practical

**METAL CUTTING
BAND SAWS**

WELLS MANUFACTURING CORPORATION
707 COOLIDGE AVENUE, THREE RIVERS, MICHIGAN

for faster, smoother cutting
the

KALAMAZOO

*Metal
Cutting*

**BAND
SAW**



**WITH OR WITHOUT
COOLANT**

Coolant Model operates continuously at highest speeds on hardest metals. Also supplied without coolant for occasional cutting jobs.

An advanced method of cutting off metal to lengths. A precision built tool costing only a few hundred dollars that handles most of the cut-off jobs in any plant.

Speeds up production—improves accuracy—saves labor and reduces costs. Standard equipment in hundreds of modern plants.

- For further information ask your dealer or write to



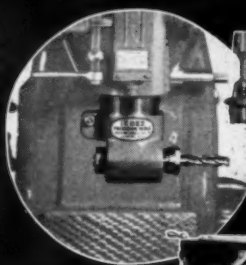
MACHINE TOOL DIVISION

**Kalamazoo Tank & Silo Co.
KALAMAZOO, MICHIGAN**

Increase Production Range with the **NEW** INDEX MILLING MACHINE

VERTICAL • HORIZONTAL • ANGLE MILLING
BORING • DRILLING

The new Index Angle-Milling Head accurately handles horizontal milling operations of every type including boring and drilling. Change over from vertical to angle milling takes only a few seconds and is done without disturbing the work on the machine table. The attachment can also be used as a cutting arbor or tool holder.

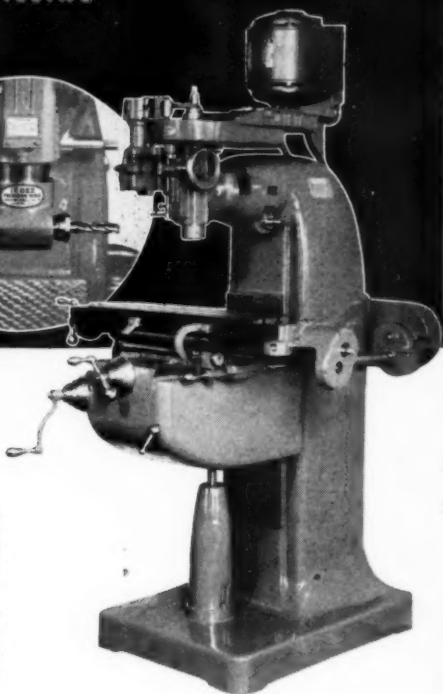


- Automatic Spindle and Table Feed.
- Table Size - 8 x 34".
- Twelve variable cutter speeds up to 2450 rpm.
- Three table speeds can be varied indefinitely.

The Model 50 Index Milling Machine offers a greatly increased range of working capacity over any machine of comparable size or cost, plus a substantial saving on production time and labor. The sound engineering and solid construction of the machine make an extremely rigid unit without deflection or chatter to throw off the accuracy of the work.

A quick change full-gear table feed mechanism delivers power to the table through a splined feed shaft. The Key Way of the Lead Screw is eliminated. Further adding to the machine's great precision and sensitive operation. Hand finishing of work is reduced to a minimum.

Other features of the Index Milling Machine include precision ground Lead Screws, large, easy-to-read Angle Dial, Automatic Controls throughout and a full line of accessories.



Send Today for the NEW INDEX CATALOG

INDEX MACHINE Co.

545 N. MECHANIC STREET

JACKSON, MICHIGAN

NEW

Stockmaster

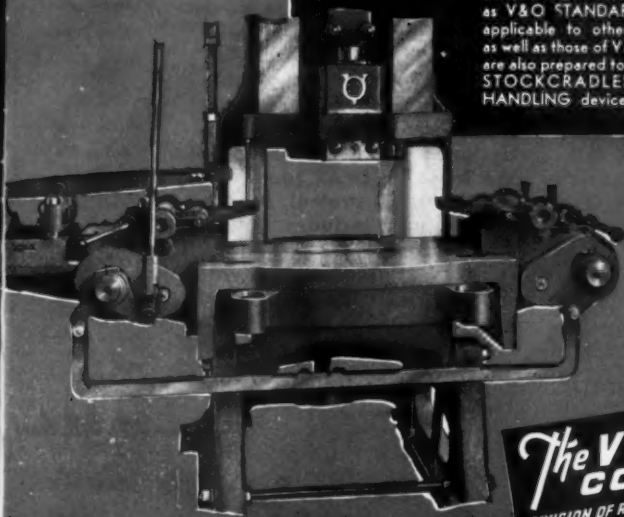
**ROLL
FEEDS**

V&O "STOCKMASTER" line of ROLL FEEDS have been designed to meet present day needs of feeding material. They are accessible and readily adjustable within capacity to varying lengths of feeds.

The clutch on the "STOCKMASTER" FEED is of the friction type and will operate to a very close degree of accuracy. These ROLL FEEDS are mounted on a special bolster, which makes it possible to remove and replace the ROLL FEED UNIT from and to a PRESS without disturbing its alignment.

In addition to the V&O ROLL FEEDS, which are made in either single or double type; scrap cutters and straightening rolls can be attached as separate items either at the time of installation or at a later date, without the need of additional bolster equipment. Our "STOCKMASTER" ROLL FEEDS are adjustable for height.

The "STOCKMASTER" FEEDS, as well as V&O STANDARD ROLL FEEDS, are applicable to other makes of PRESSES as well as those of V&O manufacture. We are also prepared to supply STOCKREELS, STOCKCRADLES or other Material HANDLING devices.



**The V&O PRESS
COMPANY**
DIVISION OF ROCKWELL MANUFACTURING CO.
HUDSON, N.Y.



Continental COUNTERBORE SETS

A Size
For Every
Purpose



THE indestructible drive and rigid, yet simple, construction of the Continental Interchangeable Counterbore assure long dependable service.



CONTINENTAL Interchangeable Counterbores are now available in a choice of three sets, each providing a wide variety of useful, dependable tools. In complete yet compact form, you will find a selection designed to fill the needs of the large or small toolroom. Set No. 1 (illustrated), for the small shop, includes cutters up to $1\frac{1}{16}$ " diameter, with two holders. Whichever set you choose, you will get fine, precision-made cutting tools.

CONTINENTAL TOOL WORKS

Division of Ex-Cell-O Corporation
DETROIT 6, MICHIGAN



Continental CUTTING TOOLS

Boring Bars and Tools

Broaches
Broach Pullers
Broaching Fixtures

Core Drills

Counterbores and Countersinks

CTW Drive Holders

Counterbores (Tool Room Sets)

Counterbore Pilots

Inserted Blade Cutters

Carbide Tipped Cutters

Form Relieved Cutters

Milling Cutters

Thread Milling Cutters

End Mills

Side Mills

High Speed Steel Reamers

Carbide Tipped Reamers

Shell Reamers

Inverted Spottacers

High Speed Steel Tool Bits

Carbide Tipped Tool Bits

Circular Form Tools

Cut-off Tools

Flat Form Tools

dovetail
Form Tools

46-44

It's the FACTS that count

PRODUCTS of quality have in them many intangibles like experience, workmanship, reputation and all the rest. But quality itself is a sometime thing. Crowing about it isn't enough. It must be backed by tangibles, by cold hard facts. Threadwell quality in taps is backed by these facts:

Ground radial relief for elimination of binding and breakage.

Ground *and* polished flutes for quick and easy chip removal without clogging.

Oxygen proof heat treatment for uniformity of molecular structure and hardness of the steel.

Cold tempering for increasing wear life.

Threads ground from solid for uniform thread structure from crest to root.

Greaseless rust-proofing for tap protection and for cleaner handling.

Color dots on shank for quick identification and selection of right tap.

Plastic tap capsule for protection against dirt and careless handling.

Inventory control on package to simplify storage and checking in the tool crib.

Process and individual final inspection to guarantee the quality of each Threadwell Tap.

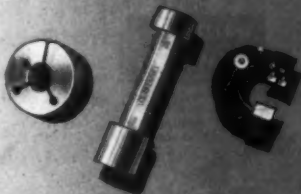
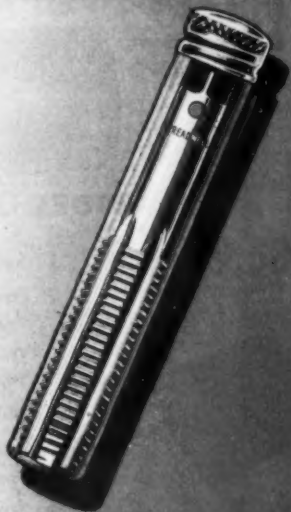
Investigate also the facts on Threadwell Fixed Gages.

Sold exclusively by Threadwell Authorized Stock Carrying Distributors throughout the United States and the world.

**THREADWELL TAP AND DIE COMPANY
GREENFIELD MASSACHUSETTS**

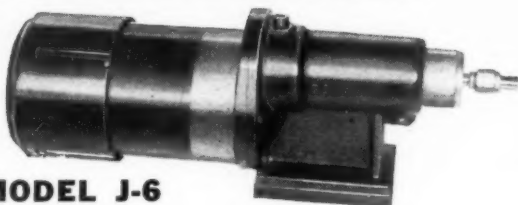


"TOOLS OF DISTINCTION"



NEW!

GOVRO-NELSON UNIT



MODEL J-6

1. Spindle speed—6000 RPM.
2. Equipped with 3-phase, 60-cycle induction motor.
3. Three-point, ball-bearing suspension for smooth operation.
4. Mechanism runs in oil bath.
5. Built-in rate of feed control for reaming purposes.
6. Dwell at end of stroke.
7. Completely automatic with remote electrical controls.
8. Integral foot for accurate alignment.
9. Machined diameter at nose for special adaptations.
10. Can be operated continuously at 35 operations per minute.

WRITE FOR
Literature

We shall be pleased to quote on drilling units only or on a complete set-up.

GOVRO-NELSON CO.

*Machinists of Precision Parts
for 25 Years*

**1933 Antoinette
Detroit 8, Mich.**

Automatic **DRILLING UNIT**



WARD STANDARD

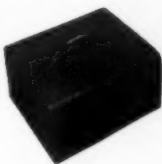
PUNCH AND DIE CABINET

Stop wasting time searching for that missing punch and die you need.

No. 32 Punch and Die Kit includes heavy metal cabinet with 64 punch and die compartments, 29 sets round punches and dies, 1/16" to and including 1/2" x 1/64" variations. Price, complete

\$49.50

Kit No. 56 same as No. 32 but contains 112 punch and die compartments and 56 sets round drill size punches and dies No. 1 to and including No. 56. Price complete



\$90.00

STANDARD PUNCHES AND DIES

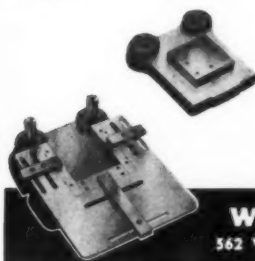
LEADER PIN TYPES, stock styles.

Illustrated are notching dies 4 1/8" x 4 1/8". Dies furnished from stock. Heavy steel gauging table with adjustable stops is provided. Price, complete

\$175.00

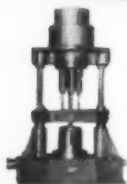
Prompt Delivery

(Member, Chicago Association of Commerce)



WARD MACHINERY CO.

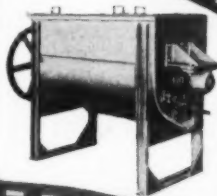
562 W. WASHINGTON BLVD., CHICAGO, ILL.



Multiple Spindle
Drill Heads &
Holding Fixtures



Fixture Gages



Special Machines

Machine Tools

**DESIGNED AND BUILT
TO MEET YOUR REQUIREMENTS**

**HERE ARE SOME OF THE WAYS
WE CAN HELP YOU**

1. Product Design

- a. By working from your sketch we make working drawings for the manufacture of the part.
- b. By changing the design, you can lower manufacturing costs or/and increase production.

2. Plant Layout

- a. We can, by working from architectural blueprints, select and layout necessary machinery and conveyor lines for the complete manufacturing process.

3. Processing

- a. We can determine necessary machinery operations by working from final drawings.

4. Tool Design

- a. We design all fixtures, dies and cutting tools to produce parts.
- b. Build and test tools.
- c. Furnish you with complete record drawings and operation sheets for filing.
- d. Design and build special machines for high production parts.

**JUST SEND US YOUR BLUEPRINTS—OR ASK US TO
SEND OUR FIELD REPRESENTATIVE**

ASSOCIATED DESIGNERS

**2450 E. MAPLE RD.
BIRMINGHAM, MICHIGAN**

SUTTONS

**RUN AS TRUE
AS THE SPINDLE**



**Diamond
Grip**

STOPS SLIP

Style "F"

Full Floating Master Collet with Interchangeable, Replaceable Jaws, For Hot Rolled Stock.

- Each jaw floats independently with full bearing on stock.
- Jaws grip tightly with one-third less tension.
- Jaws made with patented Diamond Grip Serrations.
- Prevents slippage—reduce scrap—reduce strain.
- One master per machine—jaw assortment for full range.
- Jaws quickly, easily changed—saving set up time.

"Only Sutton Collets Are Diamond Serrated"

SUTTON TOOL COMPANY STURGIS, MICHIGAN

SUTTON COLLETS

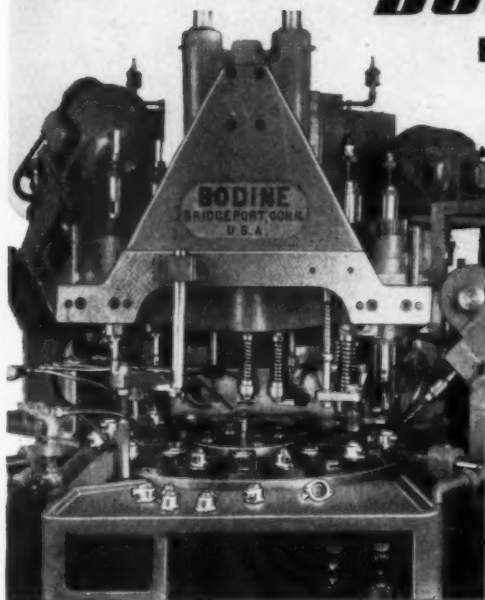
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99

HERE'S **ONE** ANSWER TO MODERN PRODUCTION

Bodine

HAS
PLENTY
MORE!



**AUTOMATIC MILLING
DRILLING, TAPPING
SCREW INSERTING**

YOU CAN'T MEET TOMORROW'S
COMPETITION WITH YESTERDAY'S
MACHINE TOOLS.

Ask Bodine engineers to adapt one
of our 6 standard machines to suit
your small parts production.

480-48



HERE'S HOW COSTS GO DOWN

PRODUCT: 2 end pieces of brass cast float valve body.

OPERATIONS: Dial has alternate stations, operator loads one fresh casting at each stroke, transfers one piece from station to next one, opposite end up.

- Part automatically clamped by air cylinder.
- Combination tool faces part over 2 1/4" dia.
- Drill, countersink 2 # 25 holes thru 1/4" thick ears (combination tool).
- Tap both holes 10-24, completing first pass under spindles. Part turned, located from finished face and 2 ear holes.
- Core drill and face the hole for 1/4" pipe tap.
- Tap 1/4" pipe thread.
- Core drill and face 7/16" dia. hole at right angles to axis (combination tool, horizontal spindle).
- Drill, counterbore 1/4" dia. hole, 45° from axis.
- Tap above hole (angularly mounted drilling and tapping spindles).

PRODUCTION: By changing dial fixtures both ends of body are produced on this Bodine 42-30 machine... 15 complete components per minute.

NUPLA HAMMERS

with
Nuplaflex
Tips



- REPLACEABLE
- INTERCHANGEABLE
- FOUR HARDNESSES
- FIVE SIZES
- THIRTEEN WEIGHTS



Nupla hammers, with replaceable and interchangeable tips are the only "All Industry" hammers designed to fill all soft-face hammer needs.

Nuplaflex tips are made in three hardnesses and with the Nuplan (nylon) tip, a complete range of four hardnesses are available for all operations, including dual purpose combinations.

Nuplaflex, the amazing "Slo-Resiliency" self-healing material is far more durable than rawhide, rubber, babbitt, lead or wood.

Write us today for complete information.

Manufactured by

NEW PLASTIC CORP.

1017 N. Sycamore

Los Angeles 38, California

SOLD BY

TRI-STATE PRODUCTS CO.

19 Seventeenth St., Toledo 2, Ohio Dept. N

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101

HERE'S HOW...

TO GET MORE PRODUCTION
FROM EXISTING MACHINES

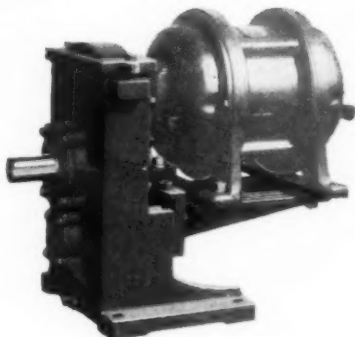
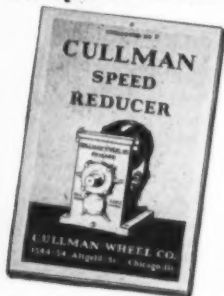
CULLMAN *Speed* REDUCERS

ADAPT ELECTRIC MOTORS TO SLOWER OPERATIONS

New Low-speed Range

For Motors $\frac{1}{4}$ To 15 h. p.

Fit Speeds To Job Needs



WRITE FOR YOUR COPY...

Get the facts! Ask for this helpful booklet which contains much useful data and facts for buyers. It describes Cullman Speed Reducers and other Cullman products.

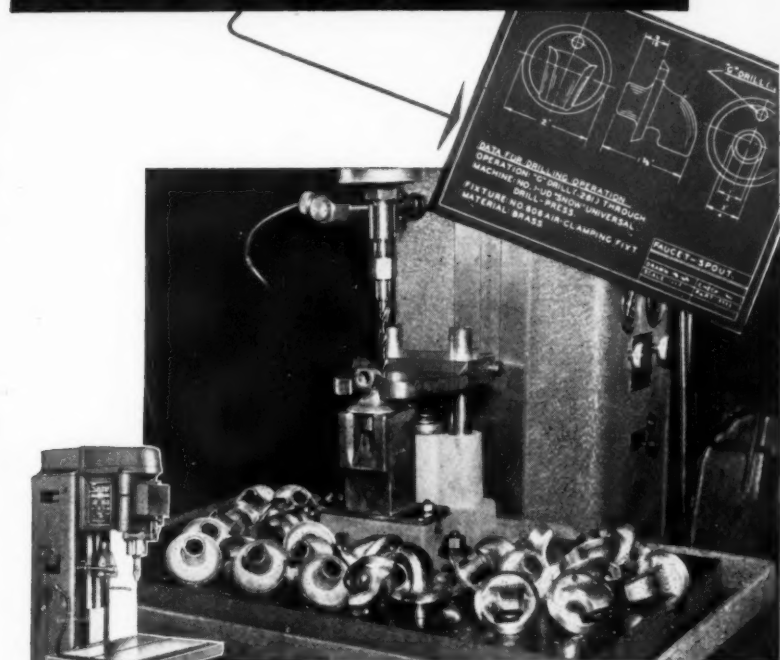
Any standard electric motor can be adapted for many new uses by adding a Cullman Speed Reducer. Compact, dependable, efficient—Cullman Speed Reducers are made in single and double reduction types. Cullman units are equipped with Helical Gears, Roller Bearings, Sprockets and Roller Chains all operating in oil. *Installation is simplified by convenient motor mountings.*

CULLMAN WHEEL COMPANY

1350-W Altgeld Street

• Chicago 14, Illinois

SNOW FULL UNIVERSAL DRILLING MACHINE



The SNOW Full Universal Drilling Machine permits the drill to set its own rate of feed resulting in higher production and greater tool life.

Precision limit switches offer extremely accurate depth control and allow instant synchronization of the many types of air operated indexing and clamping fixtures and jigs which have been designed for use with this machine. Low pressure air control built into this full universal equipment, combined with quality design and construction results in a sensitive and sturdy production machine.

This machine is capable of operating as high as 6,000 strokes per hour and has been production-tested in thousands of installations.

We suggest that you submit sample parts and blue prints for specific recommendations, production estimates and tooling data.

SNOW MANUFACTURING COMPANY

441 EASTERN AVE., BELLWOOD, ILL. • SUBURB OF CHICAGO

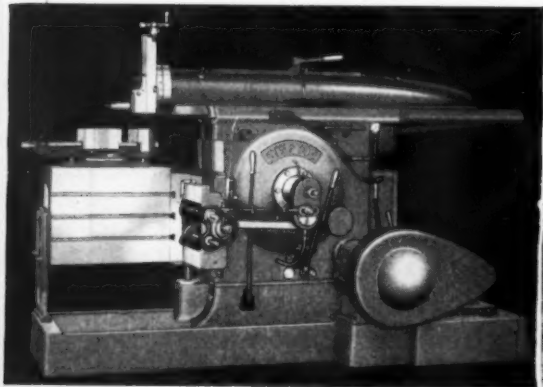
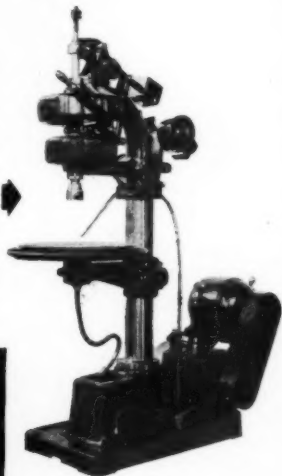


Western

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GARVIN AUTOMATIC TAPPERS — "Operator's responsibility ends at the starting lever" — Full range of sizes and multiple heads, 3/16" to 3" diameter taps — Timken bearing equipped — Adjustable torque — Precision depth and reverse control — Less tap breakage — Production estimates on request. Write for catalog No. B4612. — Specify sizes.

STEPTOE SHAPERS — Vee type ram — Centralized controls — Fully Timken bearing equipped — Forced feed lubrication — Multiple disc clutch — Helical bull gear — Involute splined shafts — 4 or 8 speeds — 7 heavy duty sizes. America's oldest and best shaper. Write for catalog No. B4620.



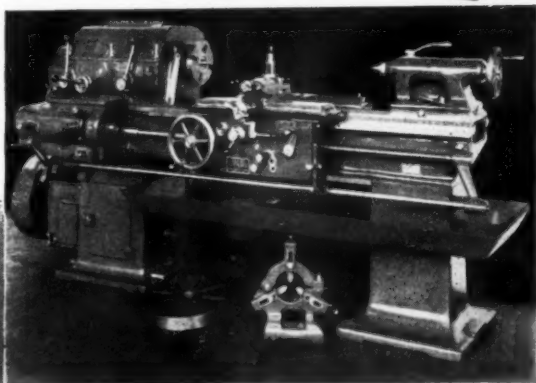
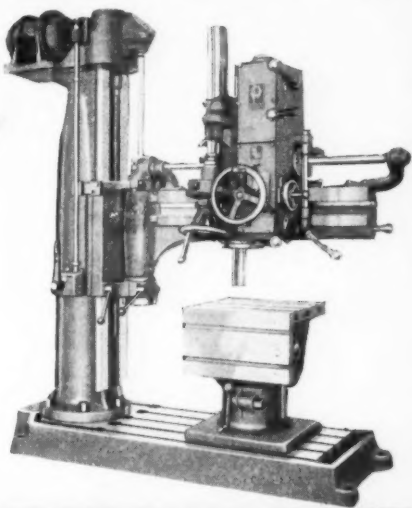
**WESTERN
MACHINE TOOL
WORKS**

THESE HIGH PRODUCTION TOOLS OFFERED BY —



**WESTERN HIGH SPEED RADIAL
DRILLS** — for economical high pro-
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— 12 speeds in head, 40 — 2000
R.P.M. — made in six sizes — Ball
bearing throughout — Write for
catalog No. B4431.

CHARD LATHES — Timken bear-
ing equipped — Geared multi-speed
or cone head — Precision hollow
spindle — Centralized controls —
Full line of accessories. Available
in five sizes: 16", 18", 20", 24" & 28"
swing over bed. Write for catalog
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**HOLLAND, MICHIGAN
CABLE ADDRESS
"WESTERN" HOLLAND**

FOR

Faster

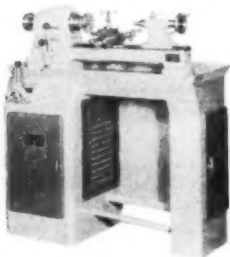
MACHINING OF SMALL PARTS

USE AN

ELGIN

- ✓ Variable Speed Drive
- ✓ Immediate speed change without stopping spindle
- ✓ Closer precision, finer finish
- ✓ Knee hole construction
- ✓ Maximum operator comfort for increased production

The entire line of ELGIN high speed precision bench tools is designed to pay you dividends in better machining results, faster production, greater versatility on a wide variety of parts and operations. Write for specifications, prices, and delivery.

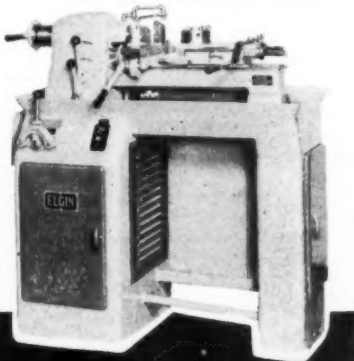


ELGIN KNEE HOLE TYPE BENCH LATHE

Has variable speed drive with range from 120 to 3,800 rpm. 9" swing, 17" between centers, 1" collet. Generous leg room for operator. Door of motor cabinet fitted with collet rack. Three roomy storage shelves.

ELGIN KNEE HOLE TYPE HAND SCREW MACHINE

Variable speed range, 120 to 3,800 rpm. 9" swing, 1" collet capacity. Collet rack inside of motor compartment door. Independent coolant system (5 gal.) mounted in rear, outside—cleaner, more accessible.



ELGIN TOOL WORKS

1772 Berteau Ave., Chicago 13, Ill.



*The signing of the Declaration of Independence
of the United States of America July 4, 1776.*

Good Judgement **PAYS OFF!**

Yes, good judgement paid dividends then . . . it will pay you dividends *now* when you select Bay State wheels for your grinding needs. This "good judgement" selection will give you consistently higher performance in countless everyday grinding jobs.

Here's why BAY STATE INTERNAL WHEELS are so widely used throughout industry today:

1. Take heavy, fast cuts.
2. Have exceptionally long life.
3. Are uniform in size and grinding action.
4. Are accurately centered . . . arbor holes parallel to face.
5. Afford consistent duplication, assuring uniform results.
6. Feature Bay State's exclusive fractional grades . . . three degrees of hardness in a single normal grade.

You will find Bay State's Operational and Specifications folder of real value. Write for it today.

*Branch offices & warehouses Chicago — Detroit
Distributors — All principal cities*

**BAY
STATE®**

Top Performance Consistently Duplicated

BAY STATE ABRASIVE PRODUCTS CO., WESTBORO, MASSACHUSETTS, U. S. A.

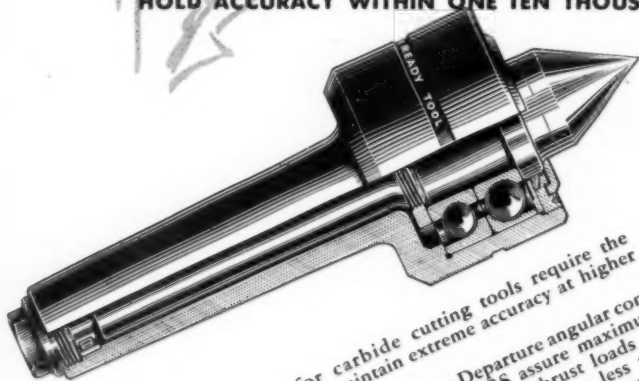
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**A LIVE CENTER SPECIALLY DESIGNED FOR USE
WITH CARBIDE CUTTING TOOLS?**

**YES, RED-E PRECISION BALL BEARING CENTERS
HOLD ACCURACY WITHIN ONE TEN THOUSANDTH!**



Increased applications for carbide cutting tools require the use of live centers that will maintain extreme accuracy at higher feeds and speeds.

Equipped with specially-designed New Departure angular contact ball bearings, RED-E Precision CENTERS assure maximum resistance to deflection under heavy radial and thrust loads . . . maximum rigidity in all set-ups . . . accuracy within less than .0001" of point zero. Your answer for precision performance . . . longer service life . . . cost per hour savings!

For detailed engineering facts on RED-E-Ball Bearing CENTERS, write Dept. B
THE READY TOOL COMPANY • BRIDGEPORT 5, CONN.

**CENTER
SPECIALISTS
FOR**

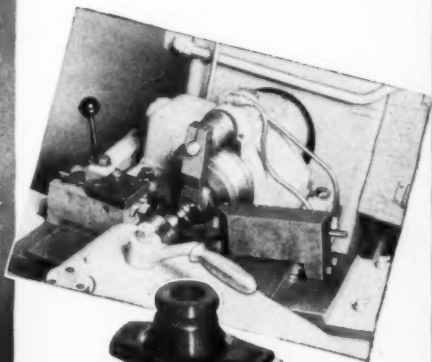
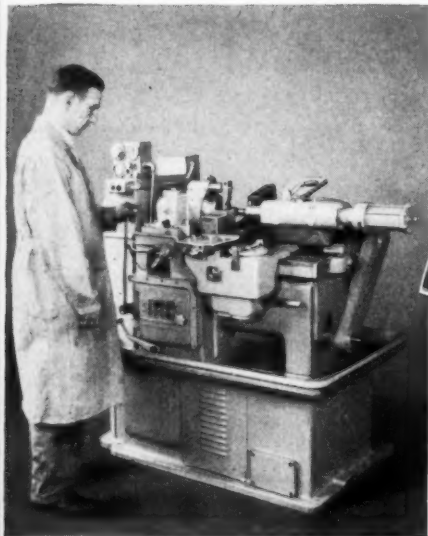


1908

1948

MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK



Lo-swing IMP

URNS AND GROOVES DISTRIBUTOR ROTORS WITH SPEED AND ACCURACY

Problem: To turn contact ring, distributor points and locking ring groove on Distributor Rotors. All machined surfaces must be concentric with the taper bore and have a fine, smooth finish.

Solution: The Lo-swing IMP Automatic Lathe was selected for this job because its design and construction provide the necessary speed, productive capacity and close accuracy demanded.

The Distributor Rotor is mounted on a special arbor which is accurately fitted to the headstock spindle bore, and prevented from working loose by a suitable locking bolt. The small end of the arbor is supported by a revolving tailstock center carrying a hardened and ground bushing which maintains a constant pressure on the end of the work piece, preventing any end play.

The contact ring and the distributor points are turned with three cemented carbide tools mounted on the front slide, while the ring groove is formed with a similar type tool mounted on the rear slide. The turning tools are properly spaced so that the intermittent cutting on the distributor points will not mark the contact ring. At the completion of the machine cycle, the operator throws an air valve, relieving the tailstock center and also actuating the work stripper arm located just over the headstock spindle.

The machine cycle is extremely fast and the operator's work is reduced to the strict minimum of loading the parts on the arbor and pushing the starting lever.

Consult our Engineering Department for full information regarding time and other saving equipment.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

PRODUCTION COSTS ARE LOWER WITH Lo-swing

REJUVENATE YOUR BROACHES

TO ORIGINAL CONDITION
(Quick Delivery)

If you have only "round"
broaches (cylindrical,
spline, etc.) up to
36 in. long
72 in. long
84 in. long

You need this
Sharpener

RG1-36
RG1-72
RG1-84

If you have only "flat"
broaches (surface
broaching)

FS3-36

If you have both flat and
round broaches up to
72 in. long
84 in. long

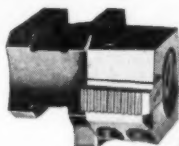
CS3-72
CS3-84

Ask for complete information by model number

with one of these Broach Sharpeners

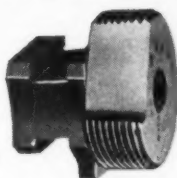


NOW- ADJUSTABLE BLADE CHASERS

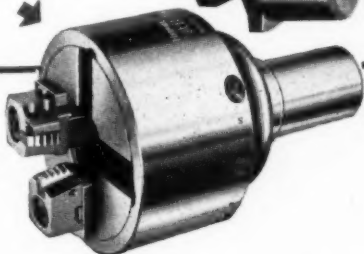
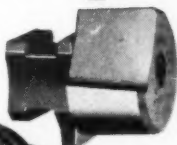


Adjustable Blade Milled Chasers or Hollow Mill Cutters—for your medium and short run jobs.

Circular Ground Thread Chasers or Hollow Mill Cutters—for your long run jobs.



Standard Vers-O-Tool Head—available in Styles DS (Stationary), DR (Revolving), and DBS (For Brown & Sharpe machines)—equally adaptable for Circular or Adjustable Blade Cutters.



... for use in your
standard Circular Chaser

VERS-O-TOOLS

Make your Vers-O-Tools more versatile than ever!

Use the standard circular-type ground-thread chasers for high-speed, highly accurate production on long run jobs. Then, with the same Vers-O-Tool head, you can get this fast, close tolerance work on medium and short run jobs—using the new, more economical adjustable blade milled chasers.

They're equally adaptable to all three styles of Vers-O-Tools within the popular range of cutting sizes from $\frac{3}{8}$ " to $1\frac{3}{8}$ ".

These new adjustable blade chasers are positioned to the specified cutting size by positive, quick diametric adjustment of the Vers-O-Tool, just as when it is equipped with circular chasers—and the

same double-barrel micrometer gage is used to provide an accurate check before and after grinding.

An exclusive design feature is the provision for take-up of block after each grind; the chasers are always up to proper cutting position regardless of the number of grinds or the requirements for different materials cut.

Vers-O-Tools are preferred for their simplicity of construction—and for their versatility. They are your best bet for fast, economical work on all production jobs in your shop. Ask for detailed literature and prices.

The NATIONAL ACME CO.

170 EAST 131st STREET • CLEVELAND 8, OHIO

Acme-Gridley Bar and Chucking Automatics:
1-4-6 and 8 Spindle • Hydraulic Thread
Rolling Machines • Automatic Threading Dies
and Taps • The Chronolog-Limit Meter Starter
and Control Station Switches • Solenoids
Centrifuges • Contract Manufacturing

**Don't
smash
it!**



Use a ROBERTSON COOL-CUT

Do your grinding wheelspeen or chatter the work? Because of the revolutionary open structure of a Robertson Cool-Cut Wheel, the grains penetrate, and remove the metal cleanly from the stock. You'll find that a Robertson wheel performs better than a more close-grained conventional wheel; cuts faster; and . . . as hundreds of users have proved . . . has a longer life-expectancy.

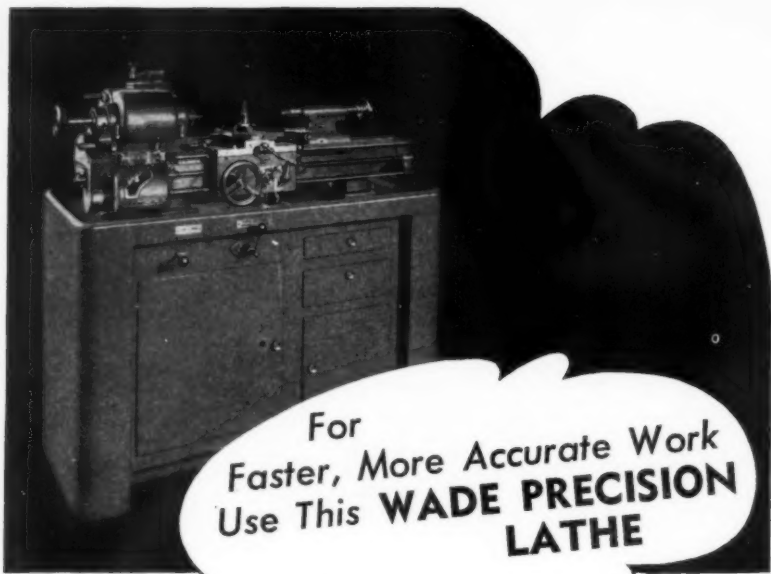
You will be interested in the results that can be obtained using a Robertson Wheel. Typical is the experience of a manufacturer of motor shafts who, in removing .015" to .020" stock from S.A.E. 1040 steel ground to a tolerance of "plus .001", minus .000", was able to finish only 10 pieces per wheel-dressing. By replacing the conventional wheel with a Robertson RA 464-MV, and with no other change in grinding method, production was immediately increased from 10 to 30 shafts per wheel-dressing!

Even if you are satisfied with your present wheels, it may surprise you to find what Robertson precision-built wheels can do. Robertson Resinoid and "Cool-Cut" Grinding Wheels, Mounted Wheels and Segments are made to tackle the toughest jobs. Blueprint your grinding problems . . . and let us recommend wheels that will solve them.

ROBERTSON MANUFACTURING COMPANY
TRENTON 5, NEW JERSEY

Resinoid and Vitrified-Bonded Grinding Wheels • Mounted Wheels • Segments





For
Faster, More Accurate Work
Use This **WADE PRECISION
LATHE**

Wade

**Bench Lathes and Profilers
For Precision, Versatility
And Stamina**

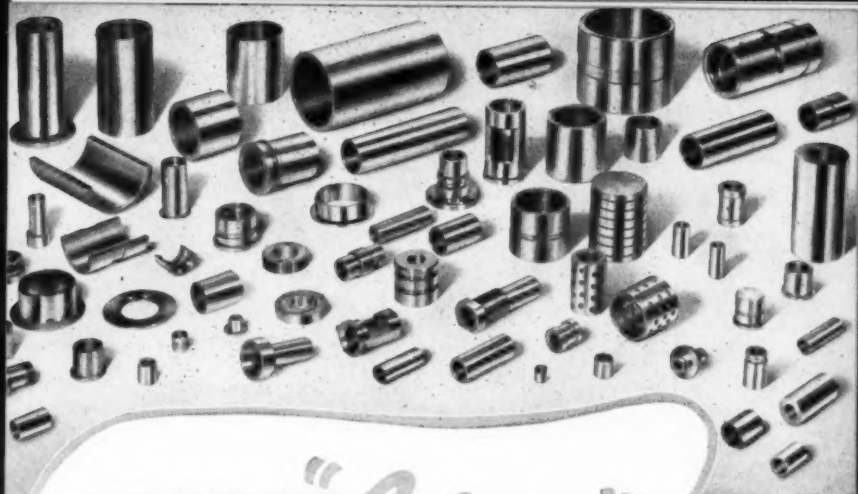
You can get faster, more accurate work with the Wade Model 8-A Toolmakers' Precision Lathe because it is carefully designed and built with features that give it extreme accuracy for exacting work. It helps speed up production by enabling men to work faster, with greater accuracy and with less spoilage. Operators can get a larger daily output because all control and operating features are carefully worked out for efficient handling of work.

Lathe bed is 44" with 24" between centers; swing over bed is 8½" and maximum collet capacity is 1". Weight, 1075 lbs.

You can depend on Wade Precision Lathes to save time . . . to save money . . . and to produce accurate work. For more profitable production of precision work, investigate this machine today. Write for catalog now.

THE WADE TOOL COMPANY

51 RIVER STREET • WALTHAM 54, MASS.



BUCKEYE *"Lubrico"*

*...The Exceptional Quality High Lead Bearings
That Pay Users Back Over and Over Again*

Buckeye "Lubrico" Bearings combine reduced coefficient of friction, excellent conformity to overcome slight shaft misalignments, the ability to withstand heavy shocks without cracking, and extremely desirable qualities of self-lubrication.

They minimize the chances of freeze-ups and breakdowns,—yet cost little more than bearings of standard analysis.

Furnished in any I. D. or O. D. and length,—slotted, drilled, flanged or threaded to meet any requirement.

Let us quote on your requirements.

Buckeye

BRASS AND MANUFACTURING COMPANY

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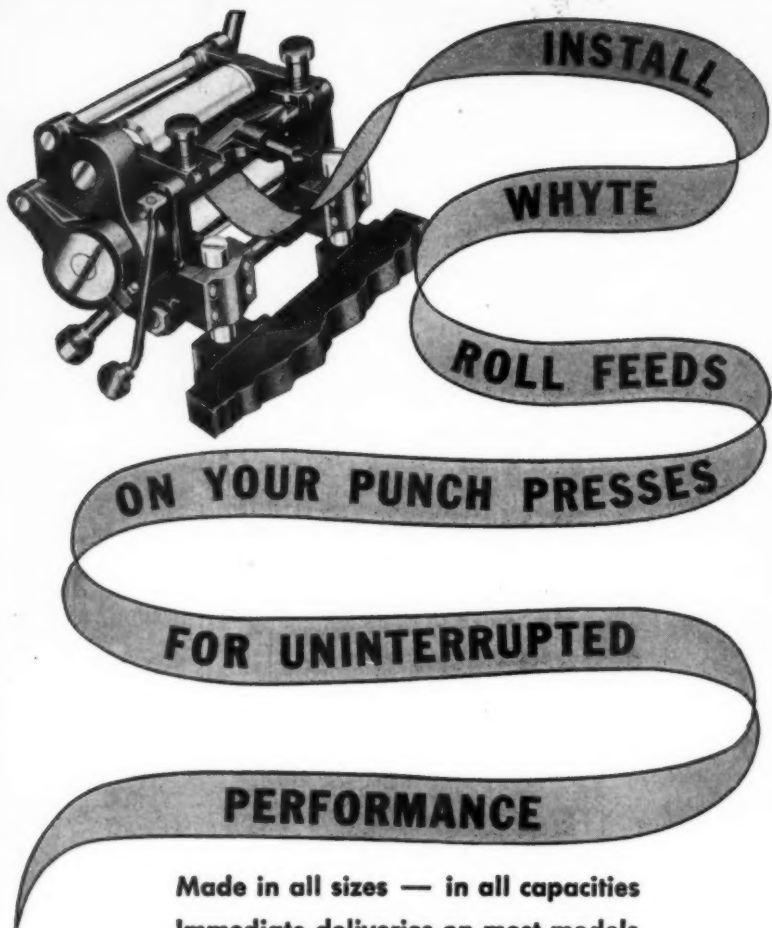


BRONZE SMITHS

SINCE 1900

CLEVELAND 3, OHIO

**BRONZE SLEEVE BEARINGS • STANDARD SIZES OR TO CUSTOMERS' BLUEPRINT
IN ANY RECOGNIZED BEARING METAL ANALYSIS**



Made in all sizes — in all capacities
Immediate deliveries on most models

WHYTE
ENGINEERING CO.
33-1 LYMAN STREET
SPRINGFIELD 3, MASS.

Also Manufacturers of
Die Feeds • Dial Feeds
Slide Feeds • Pick-Off Attachments
Stock Straighteners
Lamination Dies

THE NEW
Van Keuren

0 to 3" LIGHT WAVE MICROMETER

will improve your product...

Hardened, Ground, and
Lapped $\frac{1}{8}$ " diameter Micrometer
Screw. Reads to .00001"
Carboloy tipped spindle and
anvil



The
LIGHT WAVE
MICROMETER
HEAD

A source of depend-
able Precision for
modern machine tool
and instrument appli-
cations.

Price, with
calibration
chart
\$75.00



THE Van Keuren Light Wave Micrometer is an instrument of exceptional merit, proven over a period of 15 years. It has enabled hundreds of High School boys and girls to produce and inspect parts to "Hundred Thousandths" of an inch.

The new 0 to 3" Light Wave Micrometer has a $\frac{1}{8}$ " diameter, 40 threads per inch micrometer screw, which can be made with greater accuracy and which has 3 times the wearing surface of an ordinary micrometer screw. It has an 8" diameter micrometer wheel, with .0001" graduations $\frac{1}{10}$ " apart. It has a non parallax, vernier index which enables readings to be made to .00001". It has an index lock. It has carboloy tipped anvil and spindle. It is a sturdy, yet sensitive instrument which weighs 17 pounds. It is a portable measuring machine, built for "Sustained Accuracy."

The Light Wave Micrometer is not a comparator. No gage blocks are needed and no errors creep in from worn blocks. It is a direct source of dependable precision—fast, accurate and profitable.



The 208 page Van Keuren Catalog and Handbook No. 34 includes new epoch making formulas and 10 new tables which reduce the computations for the exact measurement of screws to a process of simple division. Price \$1.00 each postpaid.

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29th YEAR

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53A
Sundstrand Drilling and Centering Machine



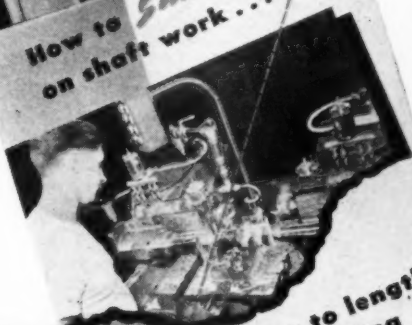
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Drilling or centering on one or both ends of workpieces can be done fast with consistent accuracy with the 53-A Drilling and Centering machine. Complete data and specifications are included in this free bulletin. Ask for bulletin No. 473-D

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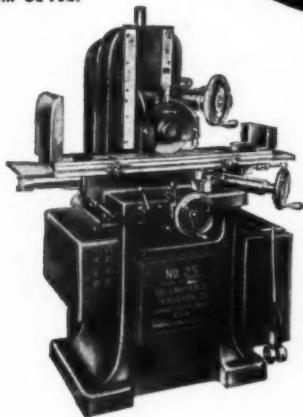
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giving complete
information**

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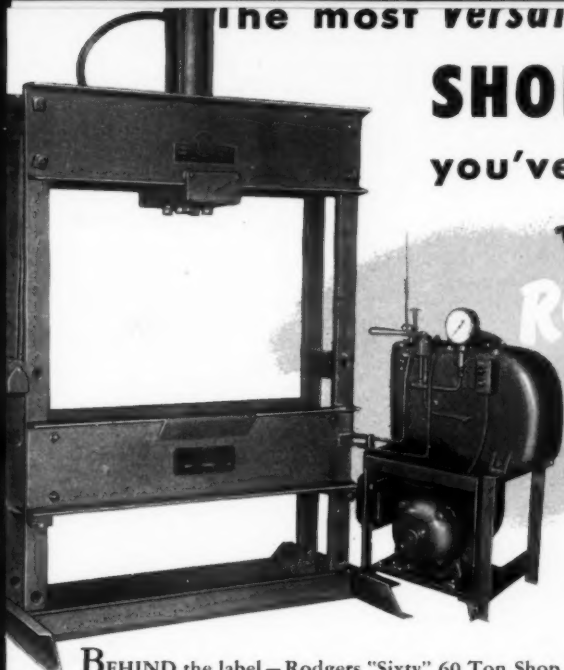
ANDERSON BROS. MFG. CO.
ROCKFORD **ILLINOIS, U. S. A.**

The most versatile, practical

SHOP PRESS

you've ever seen

THE
Rodgers
"Sixty"

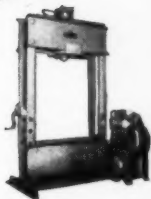


BEHIND the label—Rodgers "Sixty" 60 Ton Shop Press with power driven hydraulic pump—is a flexible, highly efficient production unit that will prove invaluable in taking care of those many miscellaneous time and labor consuming jobs. Powered with the Rodgers "D" pump and newly-designed four-way valve, it has all the desirable features of a streamlined press for general shop use where pressures up to sixty tons are required.

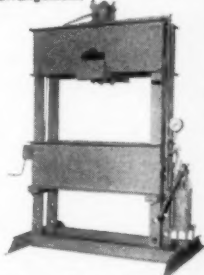
Outstanding features include: An 8" opening between columns permitting long work to be slid through either end of press without obstruction; ram and cylinder may be moved into various positions in the press without changing placement of work; bottom bolster can be raised or lowered easily with a hand crank; and V-blocks for innumerable uses in any position on the bolster. Power pumps are available with or without four-way valve—and in manual or solenoid control.

The "Sixty" is but one of Rodgers series. Standard shop presses are available in 100, 150 and 200 ton sizes, with 300 and 400 tons capacity presses made to order. All include the same proved Rodgers design and performance features. All are rugged, durable, flexible and versatile.

There is a Rodgers Shop Press exactly suited for your needs in any tough service and maintenance work in pressing, squeezing and crimping. Prompt delivery on standard models.



Rodgers 150 ton Stationary Shop Press with hydraulic "D" pump and four-way valve arrangement.



Rodgers 100 ton Stationary Shop Press with 4-speed, hand-operated hydraulic pump.

Send today for your copy of the "Rodgers Hydraulic Shop Presses" catalog. It gives complete descriptions, illustrations and specifications of the various models.

Rodgers Hydraulic, Inc.

HYDRAULIC POWER EQUIPMENT
7453 Walker Street



Portable Presses

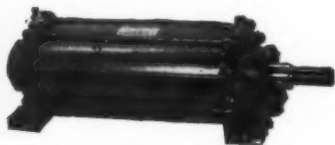


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These air cylinders are made to your order with any length stroke you request in any of these bore sizes: 1½, 2, 2½, 3, 4, 5, 6, 8, 10

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Series "E" Model 1500
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Series "E"
Model 1300
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Series "E" Model 1100
Trunnion Mount



Model 5213 Hand
Lever Operated Four
Way Air Valve

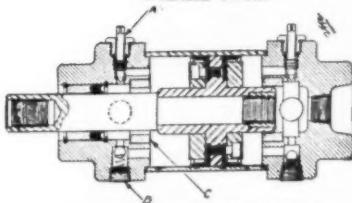
These valves are made to operate double acting air cylinders. They have ½" pipe thread inlet and outlet air ports. They have full size air passages without restrictions that permit the fastest action.



Model 5323 Foot
Operated Four Way
Air Valve



Plymouth Model 5422
Pilot Operated 4 Way
Valve



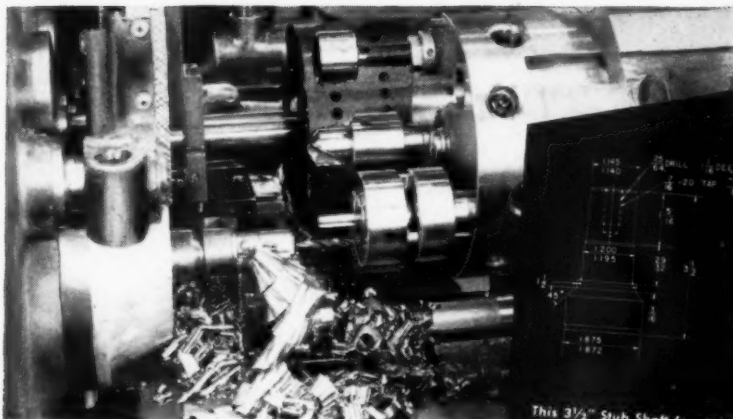
Metering Needle
"A" Ball Check
"B" and Bushing
"C" May be
added if cushion is
requested



Model 5522
Plymouth Single
Solenoid Operated
4-Way Air Control
Valves

Write for
complete
list and
information

PNEUMATICS INCORPORATED
OF PLYMOUTH INDIANA



AS SCHEDULED ON THE

CLEVELAND Model A:

Part
#4106-B

**100 PIECES THIS WEEK
2700 PIECES NEXT MONTH**

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**SHORT RUNS ON 20 OTHER
PRODUCTION PARTS IN BETWEEN**

That's the kind of *varied* production a prominent mid-western manufacturer of farm machinery will schedule, *profitably*, on their new Cleveland 2½" Model A Single Spindle Automatic.

Cleveland Model A's are *job proved* as versatile, low-cost production tools. Universal camming, and many other exclusive Cleveland quick-set-up features, makes it possible to employ the economies of high speed operation with multiple tooling to small production lots—as well as long runs.

To get the full story of the practical application of this versatile Cleveland automatic, ask Camco engineers to submit a direct proposal with production estimates on your particular work. For complete machine specifications, write now for bulletins.

This 3½" Stub Shaft formed from 1½" bar stock, S.A.E. 1045 cold rolled steel, is a typical example of one of these production jobs. Here's how the 2½" Model A Cleveland does it:

Turret OPERATIONS ON PART Positions # 4106-B

- 1 Gauge
- 2 Spot Drill
- 3 Drill 25/64" hole 1-1/16" deep. Form and breakdown with front and rear cross slides.
- 4 Open
- 5 Tap 7/16"-20 pitch thread 7/8" deep. Cut-off with independent cut-off.

The operation photograph above shows the part being formed by front and rear slides as drill enters. Note the sturdy chips.

Remember,

Cleveland's Cut Costs

THE CLEVELAND AUTOMATIC MACHINE COMPANY

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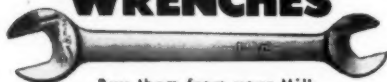
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Each supplied in all standard lengths, widths, thicknesses and teeth per inch . . . for all machines. Also in sizes for hand use.

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... AND THE BETTER BELT IS METALITE®

Case No. 3*



Machine Builder Jumps Output 400%

Typical of belt-backstand conversion is the discovery that one belt produces finishes previously requiring two or more finer grades of set-up wheels. Here, a single ≈ 80 Metalite Cloth belt performed in one quarter of the time, an operation formerly performed on a ≈ 80 and ≈ 120 set-up wheel.

The Operation — grind, polish and finish $1\frac{1}{4}$ " cast-iron pipe posts.

Original Method — ≈ 80 and ≈ 120 set-up wheels.

Belt-Backstand Method — Hammond ≈ 4 Backstand — Behr-Manning ≈ 80 -X Durabonded Metalite Cloth Belt $4" \times 14"$ — Behr-Manning Medium Soft Contact Wheel $12" \times 4" \times 1\frac{1}{2}"$.

- Improvement** —
1. One operation eliminated.
 2. Equipment reduced 52%.
 3. Production per man-hour increased 4 to 1.
 4. Better and more uniform finish.

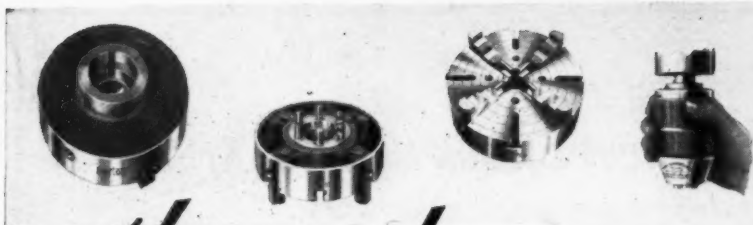
Remarks — Operators preferred to work on the belt machine — claimed it to be "less tiresome."

Write or wire or phone us for your own free demonstration of the belt method with better Metalite Cloth belts.

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(DIVISION OF NORTON CO.)
QUALITY COATED ABRASIVES SINCE 1872

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COMPLETE SERIES
OF 7 CASE STUDIES
WRITE FOR OUR
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TALKS BACKSTANDS"





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Est. 1851

"THE OLDEST CHUCK MFR. IN THE WORLD"

These Are the Features

which, with fine workmanship, high-grade alloy steels, the most modern electric furnaces and controls and correct proportions of parts, insure long, satisfactory service to the user of . . .

HORTON INDEPENDENT CHUCKS

1. The screw is supported at both ends much the same as ordinary shafting.
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FACE PLATE and BORING MILL JAWS
ELECTRIC POWER CHUCKS



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& SON COMPANY**

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Protect tools and products . . .
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In cooling tools . . . FULFLO
PUMPS go all the way . . .
for they give longer life to
tools, cut costs and permit
better finishes.

Pipe sizes: $\frac{3}{8}$ " to $1\frac{1}{2}$ ". Motor, direct or belt drives.

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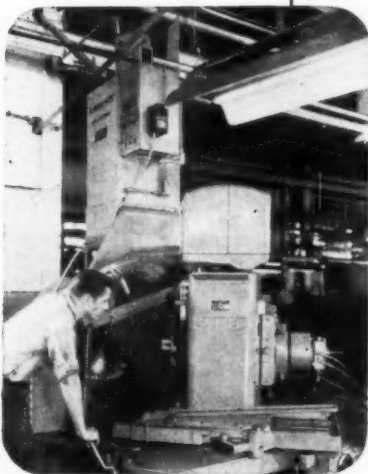
THE



Specialties Co., Inc.
BLANCHESTER, OHIO

Electro·MIST removes a hazard from high speed machining

Oil "Smog" is controlled effectively by modern AAF Electronic Collector



GEAR-CUTTING machines operating at high speeds throw off a penetrating "smog" made up of oil and smoke. It's a dangerous by-product that hampers worker visibility, results in unsightly deposits of an oily film on walls and equipment that constitutes both a fire hazard and maintenance problem. But this Gleason gear-cutting machine pictured at left is "smog-free", thanks to an AAF Electro-Mist.



AAF Electro-Mist, the electronic oil mist and smoke collector, is suspended above the cutting machine. The oil-laden "smog" is drawn directly into the collector. Smoke, oil and the smallest impurities are removed by electronic and mechanical filtration. The results? Time spent in maintenance and cleaning is cut—danger of fire is reduced—worker visibility is improved—more healthful operating conditions are created and the cleaned air can be returned directly to the work room.

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AAF Electro-Mist is a self-contained and demountable unit. Removable plate assemblies allow cleaning of collector plates at convenient locations. The unit is designed for floor or overhead mounting. Ask your local AAF representative for Bulletin No. 251 or write direct to—

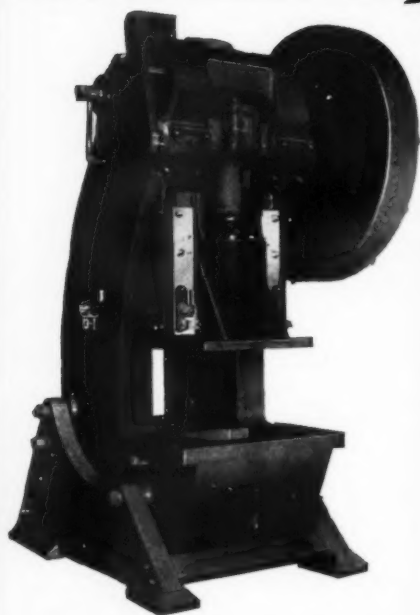
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AIR FILTERS
AND DUST CONTROL EQUIPMENT

CLEVELAND *Inclinable* PRESS

150 tons Capacity



This big ruggedly constructed, compactly designed, No. 13-l Cleveland Inclinable Press is arranged with an electrically controlled, air operated friction clutch and brake.

The Press, which exerts a pressure of 150 tons, has a stroke of 6 inches, adjustment 10 inches, bed area 30 inches x 43 inches and operates at 33 strokes per minute.

The Clutch, Flywheel, Brake and Motor are mounted between the uprights and the gears, which run in oil, are fully enclosed in oil tight guards.

Other Presses of this series include

11-l, 110 tons; 10-l, 90 tons;
9-l, 75 tons; 8-l, 60 tons and
7-l, 45 tons.

If interested in Inclinable Presses write for a copy of our Catalog

The CLEVELAND PUNCH & SHEAR WORKS COMPANY
3917 St. Clair Avenue • • • CLEVELAND 14, OHIO

Featured in ... this issue ...

DRILLING 43" DIESEL CAMSHAFTS WITH CARBIDE-TIPPED DRILLS AND DESIGN AND APPLICATION OF CARBIDE "ALL DEPTH" DRILLS, by Fred W. Lucht, Carboly Co., Inc. Another promising development in the ever widening use of carbides is "deep hole" or "gun" drilling with carbide drills. High production rates are obtained and higher feeds and longer drill life are possible. In two sections. Included in the first section is a discussion of a typical "all depth" carbide drilling job on different sizes of diesel engine camshafts. Actual examples are presented and a comparison made between the achievements of conventional equipment and carbide gun drills. One company reduced overall time on a job of drilling 9-inch long holes, 1/2" in diameter from 26 1/2 minutes to 2 1/2 minutes.

The second section covers application and design of "all depth" carbide drills. Machines, cutting fluids, cutting speeds and feeds are discussed. Page139

RECENT DEVELOPMENTS IN CRUSH DRESSING ABRASIVE WHEELS, by E. C. Luce, Norton Co. Most information available on crush dressing, as applied to grinding threads and contour forms, has dealt with wheels 1" or less in thickness. This article deals with crush dressing in relation to wheels 2" wide and approximately 1/8" to 3/16" in depth. Type of equipment, crushing and grinding conditions, coolants and type of wheels govern the degree of success obtained. Balance is important and range of differences in diameter up to 1/2" in a crush dressed cylindrical form are practical. Page151

PROVIDING ALUMINUM WITH A FLEXIBLE RUST-PROTECTIVE COAT AND PAINT BASE, by Norman P. Gentieu, American Chemical Paint Co. Alodine protects aluminum against corrosion and provides a

base for a paint coat. Equipment requirements are modest and operating time is short. Generally, two minutes in a chemical bath at temperature under 120° F. are sufficient. Alodine may be applied by immersion or spraying. Page164

LETTER FROM ENGLAND. Page179

MULTIPLE PIERCING DIES FOR MAKING MOTOR LAMINATIONS. The Reliance Electric & Engineering Company has effected substantial savings in die costs, increased production and freed equipment for other jobs by switching from notching dies to multiple-piercing them in making motor laminations. The multi-slot dies are designed to produce 5,000,000 punchings for a maximum grind of 1" of die length; but one of the dies has turned out about 11,000,000 punchings to date and is still operating. Page183

AVAILABLE LITERATURE. Page189

THIS MONTH'S INDUSTRIAL FILMS.

Page198

WHAT'S NEW IN METALWORKING.

Page207

APPOINTMENTS AND PROMOTIONS.

Page306

NEWS OF THE INDUSTRY. Page311

"SELF-HELP" UNDER MARSHALL PLAN

STRESSED BY BERNA AT ELECTRIFICATION FORUM. Page311

OBSOLETE MACHINE TOOLS BLAMED

AS CAUSE OF LOW METALWORKING

EFFICIENCY. Page316

TURNING POINTS IN THE METALWORKING

INDUSTRY. (Taken from a paper by

Myron S. Curtis, Warner & Swasey Co., presented to the Westinghouse Machine Tool Forum.) Page348

MECHANICS THROUGH THE AGES.

Page356

PRODUCTS INDEX. Page358

INDEX TO ADVERTISERS. Page366

SPEED UP TOOL WORK!

with the

TREE UNIVERSAL MILLING ATTACHMENT

- ALL ANGLE MILLING, DRILLING, & BORING • COMPACT DESIGN • $\frac{3}{4}$ " COLLET CAPACITY • 4" QUILL TRAVEL • POWER FEED • EIGHT SPEEDS—140-3500RPM or 210-5200RPM • HARDENED & GROUND SPINDLE & QUILL • ENCLOSED MICROMETER DEPTH STOP

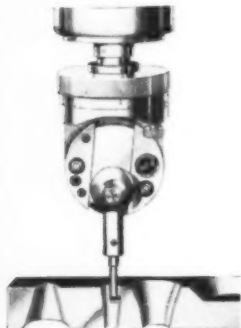
For Full Information—Write Dept. B



CUT COST OF TAPER HOLES WITH THE TREE TAPER BORING TOOL . . .

Here's a revolutionary boring tool for the milling machine, jig borer and boring bar — that not only bores taper holes, but can also be used for facing, straight boring and outside turning. . . .

Write Dept. B



TREE TOOL AND DIE WORKS

1600 JUNCTION AVENUE

RACINE, WISCONSIN

As the **Editor**

SEES IT

CAPITALISM ON SHAKY FOUNDATIONS?

A national survey, conducted by the Psychological Corporation netted the startling information that 24% of our people believe they would be happier and wealthier if business were operated by the Government. Another 9% believed they would be as well off as they are now under government ownership.

Naturally a percentage of this 33% are professional knockers, and another small percentage are probably the "have nots." But our concern is not with the professional knockers, the "have nots," or the "lunatic fringe," but with the millions of Americans who should know better, yet who believe the capitalistic system is doing them dirt.

The reason for their cynical attitude against our economic system is not difficult to ferret out. It is primarily based on misinformation and non-information, stemming from perorations of political groups whose only platform consists of changing our present governmental and economic system; or from that group of writers and lecturers who, for want of a sense of realism and want of knowledge, believe anything is better than what we now have.

Add to this the unsavory business

history of some corporations and the short-sighted labor and dollar-hungry business policies of some employers; it is inevitable that the percentage of the public thrown under the influence of these forces is extremely blasé about our economic system.

An indirect reason for the increased babble for government control is the habit of business to hide its light under a bushel. Business must clarify economic issues and point out the benefits of our present system. Certainly, neither our schools nor our Government is doing a job of selling our system to the American public.

To be sure, a co-operative group comprised of the majority of business enterprises is active in promoting the interests of business, unfortunately too frequently at the expense of the public; as such its value is probably extensive. Its success in educating the average American on capitalism is seriously questioned in the light of the 33% who would bury capitalism.

If 33% of our people favor Government ownership now, during lush times, what percentage will clamor and fight for governmental ownership tomorrow?

William F. Schleicher

Editor

A BUYING GUIDE FOR ABRASIVES

ABRASIVE PROBLEM:

How does Grinding and Sanding Efficiency continue to improve?



ANSWER BY

CARBORUNDUM

TRADE MARK

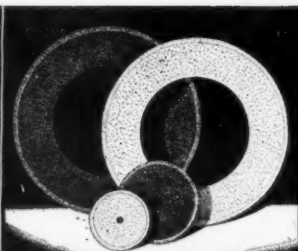
Through a continuing program of research, The Carborundum Company is constantly developing uniform abrasive products. Products that cut faster and cooler, last longer, improve finish and in other ways add to grinding and sanding efficiency.

Accomplishments of this program are well known. To the users of abrasive products they are assurance that abrasives by CARBORUNDUM are in the forefront of technical progress. It is for this reason so many manufacturers, noted for production efficiency, prefer abrasives by CARBORUNDUM. The Carborundum Company, Niagara Falls, New York.

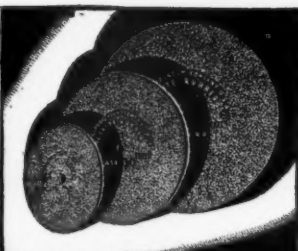


CARBORUNDUM IS A REGISTERED TRADEMARK WHICH INDICATES
MANUFACTURE BY THE CARBORUNDUM COMPANY

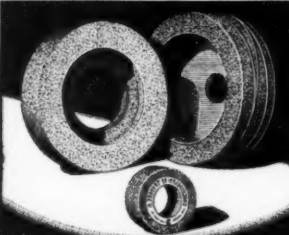
A Good Rule for Good Grinding



Specialized wheels by CARBORUNDUM
for thread grinding



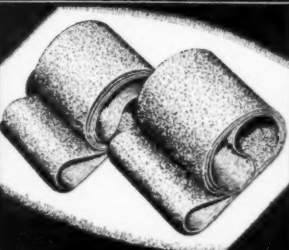
Cutting-off wheels, the modern tool
for faster, less costly, more finished cuts.



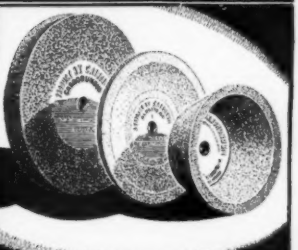
Cool-cutting green grit wheels for
cemented carbide.



Diamond wheels to meet stiffer
technical needs.



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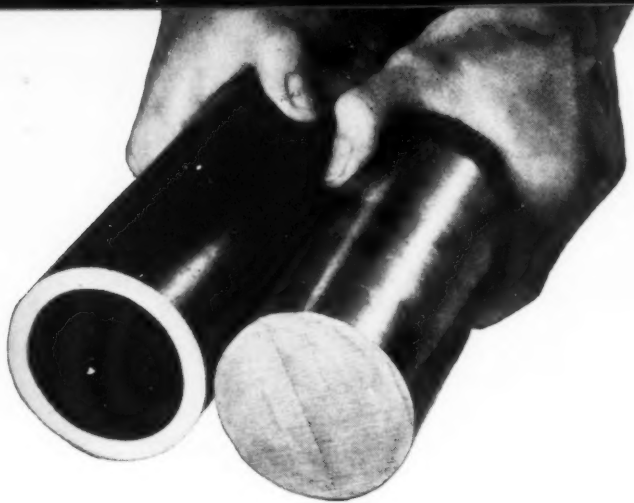
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DRILLING 43" DIESEL CAMSHAFTS

With Carbide-tipped Drills....

section 1



By Fred W. Lucht.

Development Engineer, Carbology Co., Inc.

Due to their shape "all depth" carbide drills are sometimes referred to as "gun drills" or "deep hole" drills. Carbide drills permit use of higher feed rates and give longer drill life. In section 1 of this article Mr. Lucht describes the drilling of diesel engine camshafts. In the second section of this article he discusses the design and application of "all depth" carbide drills.

ONE OF THE most promising developments in the use of carbides is the drilling of holes with carbide drills. This operation is usually referred to as "deep hole" or "gun" drilling, because of the shape of the carbide drills used. However, some of the holes for which these carbide drills are used are quite short.

"All depth" carbide drills provide a means of obtaining exceptionally high production rates in drilling all manner of holes in metals; they also permit the use of higher feeds and give longer drill life. Drills maintain their accuracy and produce smooth holes with a minimum of runout. When using carbide grinding equipment, the drills are no more difficult to re-sharpen than are high speed steel drills.

With carbide drills larger holes may be drilled at once from the solid instead of removing material by several successive drilling operations, using several drill sizes. Also, holes can be drilled much closer to the desired size because of the increased accuracy obtained when using carbide drills.

Included in this article is a typical "all depth" carbide drilling job on variously sized diesel engine camshafts. In the second section of this article is a discussion of the application and design of "all depth" carbide drills.

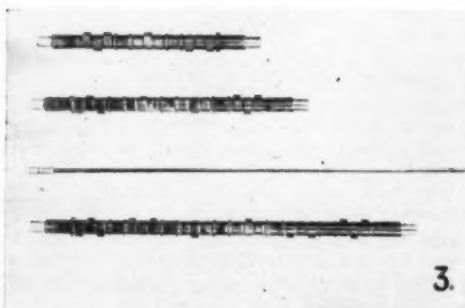
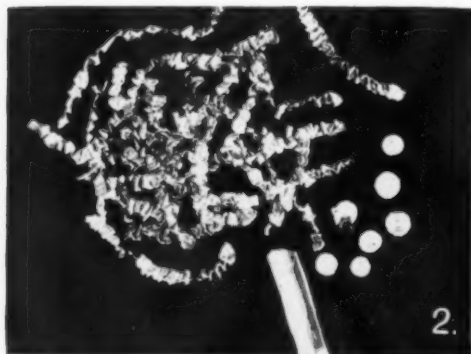
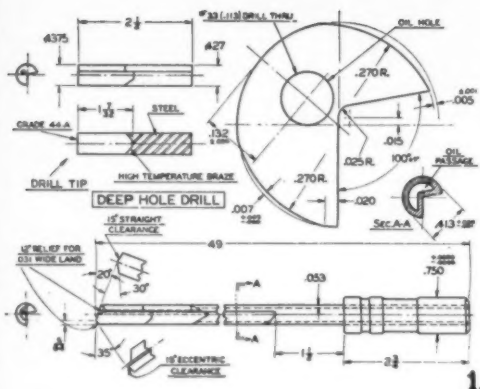


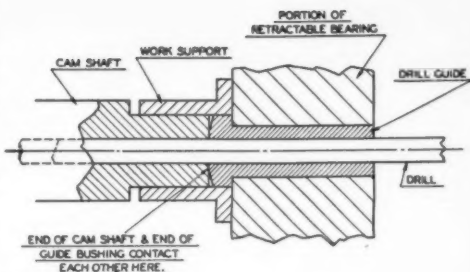
Fig. 1. is a typical carbide drill. This one is used to drill 7/16" holes through various lengths of Diesel engine camshafts. The drill tube is rolled from a steel tube having a .053 wall thickness. Solid carbide drill tips are brazed to the drill end of the tube after machining a V-shaped tongue on the tip and a V-shaped groove in the end of the tube. A steel shank is attached to the unrolled end of the tube to adapt it to the drill feeding slide on the machine.

Fig. 2 shows the type of chips produced by these drills, including the slugs which come out of the centers of the hole. Fig. 3 are three of various sizes of camshafts drilled by the tool shown just above the lower camshaft. The longest camshaft is 43 inches. Material is SAE 1045, carburized prior to drilling and of roughly 260x270 Brinell. The shafts are drilled one half from each end to reduce possibility of misalignment and insure central location of the hole at each end.

Fig. 4. It is important, in deep hole drilling with carbides, that the drill guide bushing contact a machined surface at the end of the work prior to drill entry—as illustrated in this diagrammatic sketch. Preferably, it should also revolve with the work. This insures that the drill starts on center. If the drill is correctly started, it will—of itself—stay on center as long as it has been correctly sharpened.

Fig. 5 is a close-up of the machine on which two of these

camshafts have just been drilled. The oil splash guard at one of the front spindles is open to show the chuck which rotates the camshaft. The oil splash guard next to the combination drill guide and work support has also been removed to show the steady rest. You can see some of the chips in the drip pan—washed out under pressure through the external drill flute. In this case, the maximum pressure was 300 psi at the bottom of the 21-1½ inch hole.



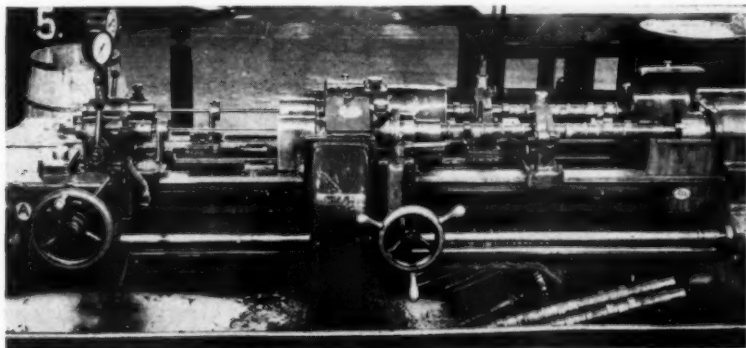
4.

Drill feed here is at a rate of 2 inches per minute, which gives a feed of .00083" per revolution. The cutting speed was 275 feet a minute, camshaft being revolved at 2400 rpm.

One machine produced 75 camshafts per 8-hour shift. Drilling time for the 43 inch long camshaft was 21.26 minutes, compared with 30.03 minutes when high speed steel drills were used. However, it should also be mentioned that the carbide drills produced some 15-20 of the 43 inch camshafts and between 20 and 25 of the 31½ inch long camshafts per drill grind. This is based on averages taken over a period of many months. The carbide drilling operations

illustrated here are not exceptional. One manufacturer is currently drilling a 2-15/16 inch diameter hole through a steel part 12 feet 10 inches long in about 4 hours, using carbide drills on an adapted boring machine.

Here is another example. A company was drilling 9 inch long holes, one half inch in diameter in thousands of parts. Floor to floor time with conventional equipment used to be 26½ minutes. By using a special machine with carbide gun drills, he reduced the overall time to 2½ minutes, floor to floor. Actual drilling time with this set-up—½ inch holes through 9 inches of steel—was only 57 seconds.



DESIGN AND APPLICATION OF CARBIDE

"ALL DEPTH" DRILLS.....section 2

There are two types of carbide-tipped drills: 1. "solid carbide" type, fig. 6, where the entire drill end is made from solid carbide; and 2. "wear strip" types made with one carbide cutting tip and two carbide wear strips, figs. 7 and 8. One wear strip is located 90° behind the cutting edge, the other is located

183° behind the cutting edge. The brazed type wear strip drills, fig. 7, can be made as small as .290" dia., using the same size drill tubes as for the solid carbide type.

The wear strip type, fig. 8, is easier to handle, particularly during drill sharpening, since the end is detachable. These would become cumbersome to handle in the larger drill sizes.

General Design

The outside diameters of all carbide tipped all-depth drills are ground cylindrically with .0006 inch per inch included back taper. After the O.D. has been ground, a longitudinal clearance should be ground along the cutting tip leaving a circular land below the cutting edge. This land "J" shown in figs. 7 and 8 should vary in width from .030 inch for a .290 inch drill diameter to .050 inch width for a 3 inch diameter drill. When grinding this clearance, the face of the cup-type wheel should just clear the periphery of the steel drill body. This land should never be touched when sharpening.

The outside diameter of the steel bodies for all the wear strip type all-depth should be made about 2% smaller than the drill size.

The oil hole in the shank end of all wear-strip-detachable type of carbide drills is counter-bored to receive the copper oil tube.

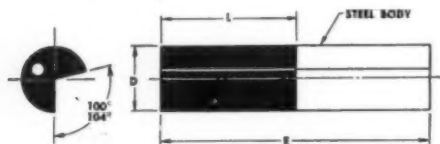


Fig. 6. Solid carbide type of all-depth drill.

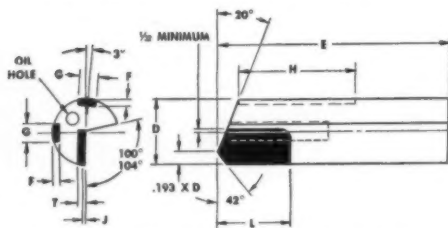


Fig. 7. Brazed type wear strip all-depth drill.

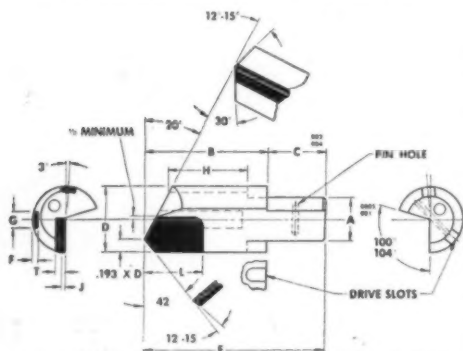


Fig. 8. Wear strip detachable type all depth drill.

The cutting edge on all carbide all-depth drills should never be above center. It should always be on center to .003 inch below center.

In attaching carbide drill ends to the drill tubes, two silver solder brazing methods are used, fig. 9. The shank end of the drill is turned down ("D") to fit inside of the drill tube. The V-shaped wall in the drill tube is milled out to receive this shank end.

In the second method, fig. 10, the shank end of the drill end is milled to a tongue shape with a 90° included angle. A 90° included groove is milled across the drill tube, using a double angular having a 1/16 inch radius at the point. The end of the tongue on the drill end should be machined to clear this 1/16 inch radius. A brazing fixture should be used to maintain alignment of drill end and drill tube.

Locate the cutting face side of the drill flute in the drill end about 1/64 inch ahead of the corresponding side of the flute in the drill tube or bar. This prevents the formation of a step to which chip particles might cling.

Fig. 12 shows the wear-strip-detachable type drill and the mating socket in the Pratt & Whitney drill bar. The drill is centralized from the straight shank and is driven by the two keys. The taper pin holds the drill head in place while the drill assembly is withdrawn from the hole. The drill bar has a fluted portion sufficiently long to clear the chips when the drill is operating at full depth. A copper tube is laid in a channel which runs the full length of the drill bar, carrying the cutting fluid from the drill feeding slide to the drill. This oil tube projects into a counterbore in the oil hole in the shank end of the drill and prevents the oil from spraying out of the joint between the drill and the drill bar.

Grinding All-Depth Drills

A drill ground to specifications, fig. 12, will be satisfactory.

All grinding should be done free-hand. The same type of grinder used for cemented carbide tipped single point tools may be used. When rough grinding the 42° outer cutting angle, the drill should be held firmly by hand in a V-block, which is swung at a 42° angle, and the grinder table tilted at a 12°-15° angle. During this operation the drill should be rotated about its own axis, as when grinding the end of any drill, to produce the 12°-15° eccentric angle.

When rough grinding the 20° inner cutting angle, the drill should be held firmly by hand in a V-block which is swung at a 20° angle and the grinder table tilted at the 12°-15° clearance angle. During this operation the cutting tip face surface should be kept parallel to the top of the grinder table. A simple fixture can be developed for this operation. Locate the drill point at a distance equal to .193 x drill diameter away from the outside diameter of the drill. Use a 60 grit silicon carbide cup-type wheel for these operations.

Finish grinding of both the 42° and the 20° angles at an 8° relief angle may be done in the same similar fixtures. In this case, of course, the table would be tilted at 8°. The land below the cutting edge should be about 1/32 inch wide. 100 grit to 150 grit diamond cup-type wheels are generally used for this finish grinding operation.

The steel drill body above the cutting edge and behind the drill flute should be ground away at a 30° angle, as shown. This aids the flow of the cutting fluid into the drill flute. A 46 grit aluminum oxide wheel is suitable for this grinding operation.

Sharpening should be done only on the end of the drill. The face of the cutting tip should never be touched. This face is located on center to .003 inch below center when the drill is made. Any alteration of this position may reduce the efficiency of the drill.

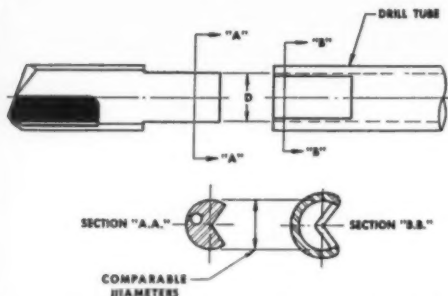


Fig. 9. One of the two methods of brazing carbide drill ends to the drill tubes. Note, shank end of drill turned down to fit inside of drill tube.

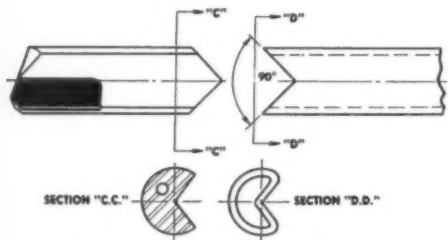


Fig. 10. Second method of brazing carbide ends to drill tubes. Note shank end of drill end milled to a tongue shape with a 90° included angle.

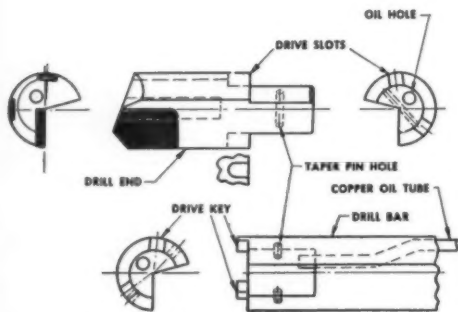


Fig. 11. Wear strip detachable type of drill and mating socket in a Pratt & Whitney drill bar.

Machines

The all-depth drill is self-grinding in the work. It follows the general direction in which it has been started. Therefore, the drill guide bushing in the combination drill - guide - and - work - support is one of the most important parts of a drill set-up, fig. 13. The bushing itself should be hardened and ground, and should run freely in an anti-friction bearing. For best results, the drill should be guided through the bushings and fed into the work while the work is rotating at the correct cutting speed.

As shown in fig. 13, the revolving guide bushing is forced against the work piece under spring pressure and revolves with the work. This helps get the drill started properly. After the drill is in the hole, it is self-guiding. A drill — as ground — really has a floating action in the hole because all of the unbalanced cutting forces are neutralized by the wear strips. The wooden wedges also shown in fig. 13 are driven into the guide bushings to dampen drill vibrations.

Cutting Fluids

Removal of the drill chips is the most important functions of the cutting fluid. The fluid, forced under high pressure through the entire length of the drill into the annular-shaped groove "A", fig. 14, produced by the drill and then out through the V-shaped drill flute, washes the light, fluffy chips through the drill flute to the open end of the drilled hole and so into the chip duct.

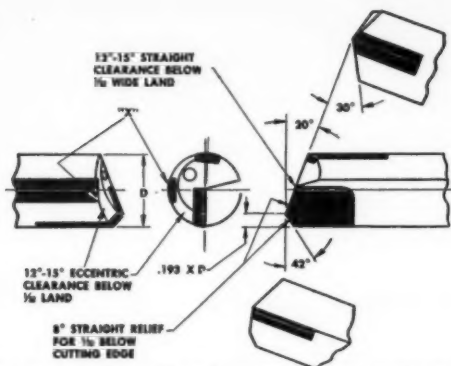


Fig. 12. Cutting and relief angles for carbide all-depth drills.

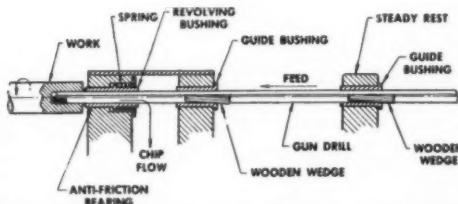


Fig. 13. More important details in connection with drill guide bushings. Revolving guide bushing is forced against work piece under spring pressure and revolves with the work. Wooden wedges are driven into the guide bushings to dampen drill vibrations.

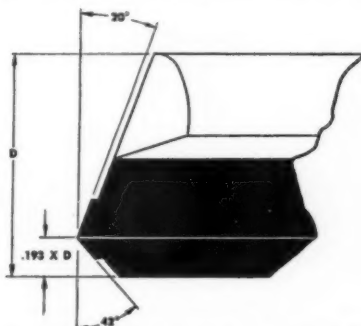


Fig. 14. Chip flow through all-depth drill.

The oil pressure should always be high enough to keep the chips flowing continuously away from the cut. Working range of oil pressures for various carbide drilling jobs varies between 300 and 800 pounds per square inch. The actual oil pressure for a given job varies with the drill size, depth of the drilled hole, and rate of feed.

Cutting Speeds and Feeds

The work being drilled should be rotated at an RPM which will give a cutting speed—at the outside diameter of the drill—ranging between 130 and 350 SEFM. It is suggested that a new job be started at from 200 to 250 SEFM and the speed varied in either direction until a satisfactory balance between drill life and the feed rate is obtained.

Practically all "gun drill" work to date has been done with feeds within the range of .0006 inch to .0036 inch per revolution.

The rate of feed, however, also depends on the oil pressures being used and the size of the oil hole through the drill. For all-depth drills to function properly at high feed rates, the rate of oil flow must be sufficient to prevent chips from packing in the drill flute. It is advisable to use a 100° to 104° included angle for the flute, fig. 15. Also, the ratio of the cross-sectional area of the oil hole "B" to the cross-sectional area of the drill flute "A" should not be less than 1 to 4.3.

Wear strips last longer if small oil grooves "D" are milled ahead of each wear

strip, fig. 15. The rear end of each groove should be connected to the main oil hole "B" by a drilled hole "F". This permits a uniform distribution of oil in front of each wear strip. Frequently, an additional oil hole "C" is drilled through the steel body. In this case, oil holes "B" and "C" are connected to enlarged oil hole in the rear end of the drill end.

It has also been found that as the rate of feed is increased, there is an increased tendency for the drill to deviate from its true course.

Rotary All-Depth Drills

Frequently the question is asked if carbide tipped all-depth drills can be rotated instead of rotating the work—particularly where the work is not only irregular but is also too large and heavy to be rotated readily. The general indications are that long drills should not be rotated because the unsymmetrical shape and the relatively small cross-section tend to set up an unbalanced condition which may result in drill chatter and a rapid breakdown of the cutting edge. This becomes particularly pronounced at the much higher RPM of carbide drills as compared with high speed steel drill practice. It may be feasible to rotate a short drill, however. In this case, an alternative design of drill shown in fig. 16, may be used. The cutting angles may be comparable to those used in the stationary drills, while the chips would be carried out through the center of the drill instead of external flute.

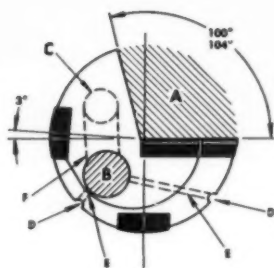


Fig. 15. Carbide drill to show the 100°-104° included angle for the flute.

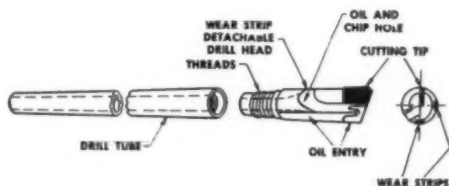


Fig. 16. Special design for a short drill which can be rotated instead of rotating the work. Cutting angles are comparable to those used in stationary drills; chips are carried out through center of drill instead of an external flute.

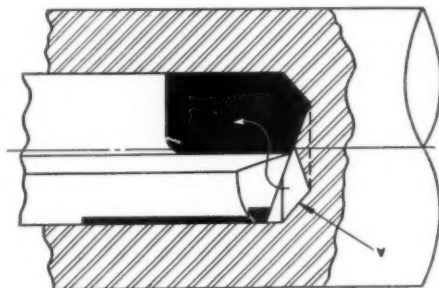


Fig. 17. When the all-depth drill approaches a diameter of 2 1/2 inches, it is necessary to break the broad chip which comes from both the 20° and the 42° cutting angles. Steps ground in the cutting edges will do this effectively.

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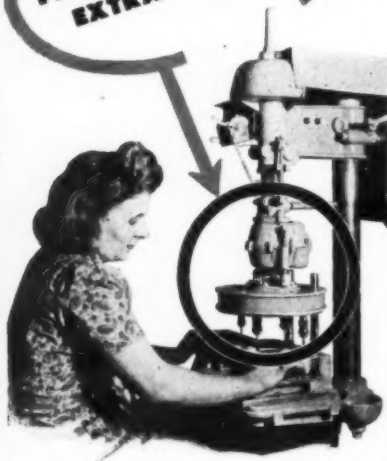


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General Conditions

Wherever a drill steady rest has to be used, the smoothest operating conditions are always obtained if the drill steady rest is located approximately midway between the drill feed slide and the combination drill guide and work support carriage.

Occasionally a drill may "sing" as a result of high frequency vibration or chatter. Generally, "singing" can be eliminated by driving a triangular-wooden wedge into the two guide bushings as previously shown in fig. 13. These wedges should be tightened from time to time.

Current indications are that when all-depth drills approach a diameter of 2½ inches, it is necessary to break the broad chip which comes from both the 20° and the 42° cutting angles. Stops ground in the cutting edges will do this effectively, fig. 17.

If the cylindrical land along the cutting edge shows signs of rapid wear, the excessive pressure can be relieved by increasing the distance from the periphery to the drill point by a slight amount. If the wear strip located at 183° behind the cutting edges shows excessive wear, a slight decrease in the distance from the periphery to the drill point will remedy the condition.

A slight change in the relationship between the 42° outer cutting angle and the 20° inner cutting angle will also change the amount of side pressure in either direction. A change in these angles may also be used as an aid in breaking up the chips flowing from the drill. THE END.

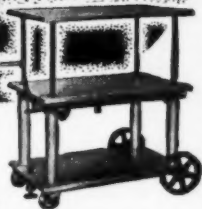
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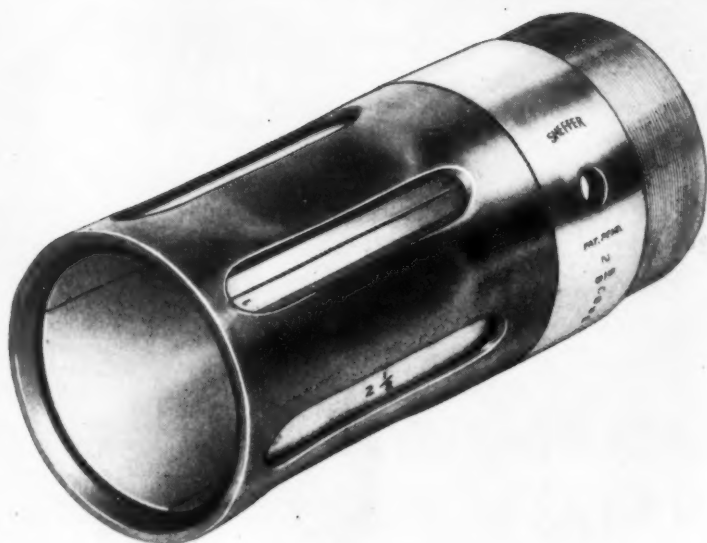
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by E. C. Luce,
Abrasive Division, Norton Co.

Tests prove the practicality of crush dressing and grinding contour forms as wide as 2" and approximately $\frac{1}{8}$ " to $\frac{3}{16}$ " in depth. Equipment used and procedure followed in conducting these tests are described by the author.

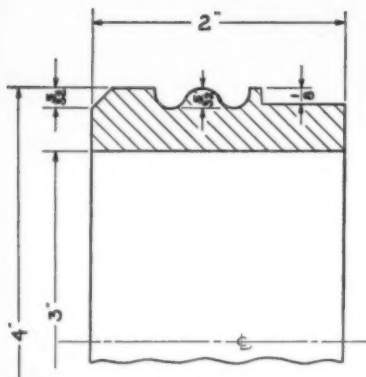
THE SUBJECT of crush dressing has been discussed by those closely associated with its development and application. The greater part of such discussions have dealt with crush dressing as applied to grinding threads and contour forms, using relatively narrow wheels, 1" or less in thickness. This article will describe the experiences and results obtained with crush dressing of contour forms as wide as 2" and approximately $\frac{1}{8}$ " to $\frac{3}{16}$ " in depth.

While the findings of tests on 2" wide wheels checked closely with those obtained in crush dressing threads and narrow contour forms, there were some conditions involving the use of wider forms, that required closer attention.

Equipment

For the purpose of the tests, a Norton 10 x 48" Type C, Plain Cylindrical Grinder was modified for crush dressing. A crushing mechanism mounted on vertical ways was built into the machine as an integral part of the wheel head slide. A 4" diameter hydraulic cylinder was used for applying the crushing roll in a downward direction to the top of the grinding wheel.

In order to have sufficient power available, a 15 h.p.



The form of crushing roll used as a standard, included sections parallel and almost perpendicular to the axis, as well as convex and concave curves of moderate radii.

• • •

motor was used to drive the 24" diameter abrasive wheel during grinding. A $\frac{1}{2}$ h.p. motor was connected to drive the grinding wheel at low speed during crushing.

The form of crushing roll which was used as a standard throughout most of the test, included sections parallel and almost perpendicular to the axis, as well as convex and concave curves of moderate radii, see drawing. The grinding cut was made on a section of work initially straight, about 2" in diameter and 2" in width. The depth of cut on various parts of the wheel face ranged from only enough to "clean up" to as much as $\frac{1}{8}$ " on a radius.

Early in our test program, it was found that in order to crush the contour form accurately, high closely controlled crushing presses and great machine rigidity were necessary. On contour forms, such as the one employed in this test, it is desirable to have crushing pressures available up to 500 pounds per inch of wheel width. Also, as in

all crushing work, there must be a minimum of end-play in the wheel spindle and crushing roll bearings. The crushing roll support itself must be rigid to maintain accuracy of work and finish.

In the course of the test, we also experimented with a substantial crushing fixture clamped to the table of the machine, figure 2. The setup proved to be as adequate as the fixed, integral mounting in the wheel head slide from the standpoint of accuracy of crushing. However, such a fixture possessed the disadvantage of requiring hand feeding of the crushing roll and presented difficulty in re-registration of the roll.

Cross-gashing was not found necessary on a contour form such as we are discussing here.

Crushing Conditions

It has been pointed out that for crushing relatively wide contour forms, considerable pressure is required. The highest pressure used in our tests on a 2" wide wheel face was estimated at 750 pounds.

The wheel speed during crushing does not appear to be critical. Only one speed was available for our test, 300 s.f.p.m. for a 24" diameter wheel. This was found to be satisfactory. For the crushing operation, the wheel was driven by a separate motor which in turn drove the crushing roll it contacted.

Some means of cleaning the crushing roll during the crushing operation is essential to prevent adhesion or impingement of abrasive and bond to the roll and consequent pitting of the wheel face. This important precaution may mean the difference between success and failure of the crushing operation. A flexible wiper pressed against the roll face is recommended as a cleaning device, rather than a rigid scraper which will not maintain complete contact.

Hardened steel crushing rolls were

used in our tests. Maintenance of crushing roll form was considered satisfactory. Each regrind of the crushing roll was good for one dressing, starting with a flat wheel face, up to a maximum of 10 redressings. The crushing operation should be performed wet, preferably with a straight grinding oil. When used with a water-soluble coolant, more frequent regrinding is necessary.

The time cycle for crushing should be carefully controlled to prevent chipping or spalling of the wheel face. This control should be provided by applying the roll to the wheel through a fixed feed rather than by constant pressure. Full pressure at first contact creates excessive unit pressure. The time required for crush dressing the form used in these tests to $\frac{1}{8}$ depth was 10 minutes, starting with a flat wheel face. One to two minutes' contact time was required for recrushing.

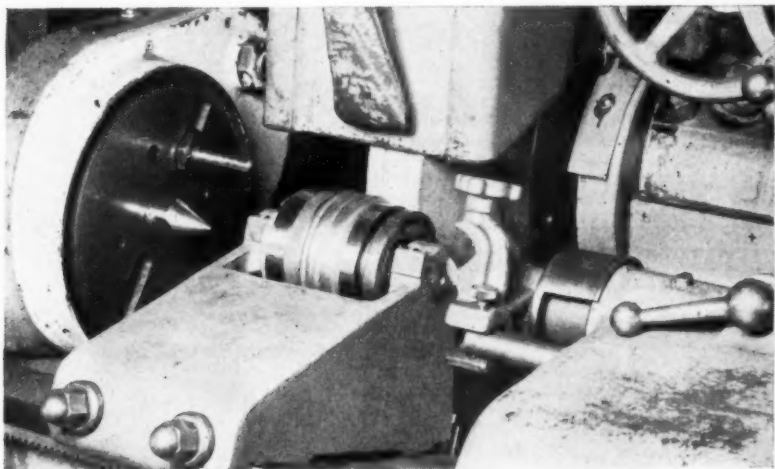
Grinding Conditions

The wheel used throughout the test was in the size 24" x 2" x 12" and was operated at 6,000 s.f.p.m. The question of proper work speeds was given considerable study. Experience to date on crushing thread forms and shallow, narrow contours indicates these can be ground easily to full depth in one revolution and in a fraction of the time. Such forms are ground without requiring excessive power. However, on a contour form as wide as 2" and as deep as $\frac{1}{8}$ ", considerable power was required. Adequate power for the wheel spindle should be available when contemplating crush dressing of similarly wide and deep contours.

Work speeds from 1 to 132 r.p.m. were tried. The most satisfactory performance was achieved in the range

• • •

The crushing fixture is clamped to the table of the machine. While this set up did a good crushing job, it presented difficulty in re-registration of the roll.



of from 25 to 60 r.p.m. With the work speed reduced to between 1 and 10 r.p.m., some reduction in profilometer reading resulted, but the wheel wear increased and there was also more oil smoke, longer die-out time and more power consumed, which indicated less free cutting action. At the highest work speed tried, the roughest finish was obtained.

The above findings are summarized in the following table:

with the finer grit wheels. The superiority of oil was also more apparent when grinding hard steel. There were some obvious objections to oil such as smoke, mist, and heat left in the work. However, the overall advantages of oil in crushing and grinding more than offsets these minor objectionable features.

Filtering of the oil is strongly recommended to prolong crusher roll life and improve work finish. As to advice

Table I

Work Speed	Die - Out Time	Wheel Wear (Loss in Diameter)	Surface Finish	Power Required
1 r. p. m.	0.7 min.	.013"	25 r. m. s.**	8800 watts*
10 "	0.3 "	.010"	32 "	5300 "
25 "	0.2 "	.009"	27 "	5000 "
32 "	0.1 "	.009"	34 "	4700 "
60 "	0.15 "	.009"	31 "	5500 "
100 "	0.1 "	.012"	38 "	4700 "
118 "	0.1 "	.012"	38 "	5000 "

*Each 1000 watts of power is equivalent to about 1 h.p. consumed at grinding contact.

**Root mean square (Profilometer reading)

Grinding Coolants

Coolants were found to exert considerable influence on both the crush dressing and grinding results.

The results were much less satisfactory when a soluble oil coolant was used instead of straight grinding oil. We found this to be especially true

on the proper oil to use for crushing and grinding, any reliable manufacturer or distributor of cutting and grinding oils should be contacted. Special oils have been developed by some of them for crush dressing.

Attempts to use a water-soluble oil coolant generally resulted in crushing

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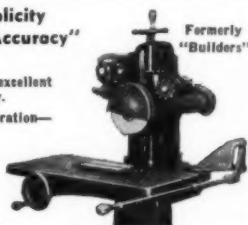
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of the sub-surface structure and severe spalling, unless considerable care was taken. Even when a wheel face was successfully crushed, the subsequent grinding operation with soluble oil and water caused greater wheel wear and required greater power input than when using oil. Table II shows the variation referred to with soluble oil coolant and grinding oil.

crush dressing than the special, more friable types of aluminum oxide abrasive. In a comparative test of wheels made with these two types of abrasives, both 100 grit, on hardened steel work, the former abrasive wheel gave a lower rate of wear, lower power input and a better finish.

For a typical contour form, the grit sizes found most satisfactory were:

Coolant	Number of Cuts	Table II Wheel Wear (Loss in Diameter)		Power Required	Surface Finish
					(Profilometer Rdg.) Last Cut
Soluble oil and water 1:50	10	.084"		5500 watts	45 r. m. s.
Grinding oil	10	.065"		3100 watts	32 "

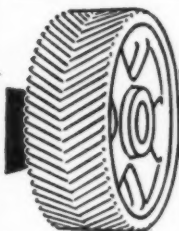
Grinding Wheels

Tests indicated that wheels made of strong and tough regular aluminum oxide abrasive are better suited for

On soft steel — 60 grit

On hardened steel — 100 grit

On each type of steel, wheels of these respective grit sizes exhibited the fas-



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test stock removal and maintained form satisfactorily. Finer grit sizes did not give a sufficiently better finish to warrant their use. However, for forms requiring still sharper radii and closer tolerances as well as for thread grinding, it is to be expected that somewhat finer grit sizes such as 150, 220, and 320 may be required.

The following table III shows a typical difference in results between regular and the special, more friable types of aluminum oxide abrasive. All wheels were 100 grit size and grade N, in two types of vitrified bond.

For crushing the contour form used in our test work, vitrified bonded wheels were the only type that could be successfully crushed. Attempts were made to crush resinoid and rubber bonded wheels but only slight impressions could be made on the wheel face at the full crushing pressure of 750 pounds.

No significant difference in performance was noticed between wheels of various types of vitrified bond. This fact may be noted in Table III.

Maintenance of Balance

As might be expected, balance was

Table III

Vit Bond Type	Wheel	Wheel Wear	Net Power	Surface Finish 1st Cut	Reading 10th Cut
X —	(Regular aluminum) (oxide, 100 grit)	.009"	2750 watts	20 r. m. s.	25 r. m. s.
X —	(Special aluminum) (alum. oxide, 100)	.011"	3500 "	28 "	30 "
Y —	(Regular aluminum) (oxide, 100 grit)	.009"	2750 "	23 "	25 "
Y —	(Special aluminum) (alum. oxide, 100)	.010"	3675 "	30 "	33 "

Grade and Bond

Most of our test work was conducted with wheels of grades L and N. The softer grade was found to be sufficiently hard in most cases to hold the required form. It appears that choice of grade is not as critical with a crushed dressed wheel as one that is diamond dressed.

found to be an important factor with wheels that are crush dressed, particularly because of the somewhat rougher finish that is obtained with a sharp, crushed dressed wheel. To avoid chatter marks and insure the best possible finish, a wheel that is crush dressed should be put in good balance.

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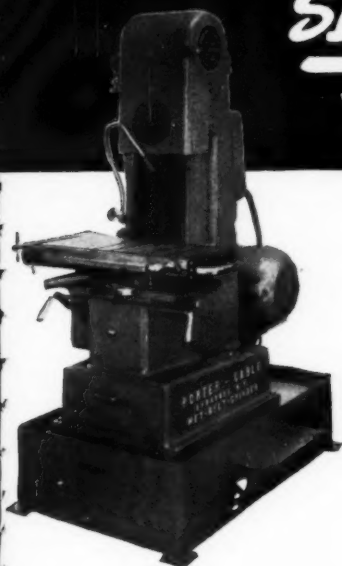
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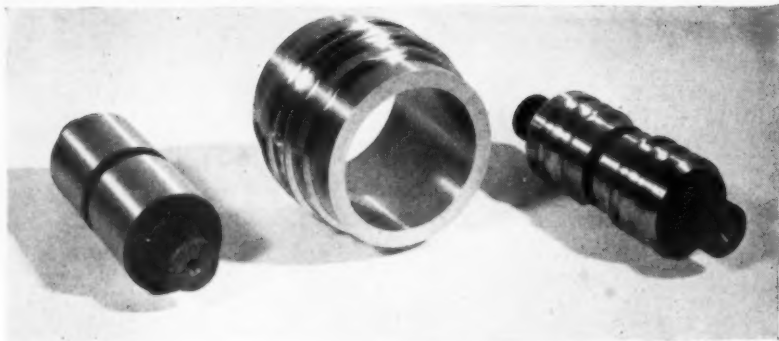
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View showing the unmounted crushing roll in the center, the unground workpiece at the left and, on the right, the ground workpiece.

wheel, it first be trued with a diamond. The wheel and its sleeve should then be dismantled as a unit and the assembly balanced in the conventional manner on a balancing stand. It is then ready to be crush dressed on the machine.

Limitations of Form

Differences in diameter up to $\frac{1}{2}$ " in a crushed dressed cylindrical form are within the practical range. Greater differences are possible but the cost of rolls and dressing will increase proportionately. Also, the maximum depth of the form that it is possible to crush is less as the slope becomes steeper. It does not seem to be commercially profitable to crush dress contours with sections that are exactly perpendicular to the axis. However, they may approach the perpendicular within a few degrees.

The accuracy of the crushing roll and its life depends upon the roller rotating with the grinding wheel so that no grinding of the crushing roll takes place. On a straight form, the roll will turn readily with the wheel. As a radius or bevel is introduced, there will be some relative speed difference and

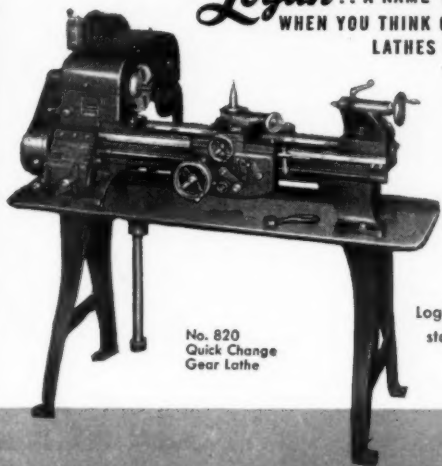
as the depth of form is increased, the difference in wheel speed between certain portions of the roll and the wheel becomes more pronounced. This, of course, causes the roll to slip and wear, which in turn tends to destroy the accuracy of form. When this point is reached, other means of dressing the form may have to be considered. THE END.

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The Research and Metallurgical Laboratories of The Carpenter Steel Co., Reading, Pa., received the announcement that B. H. DeLong, vice president and technical director, was awarded the Bradley Stoughton plaque.

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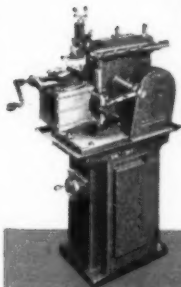


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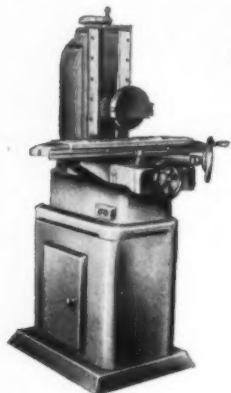
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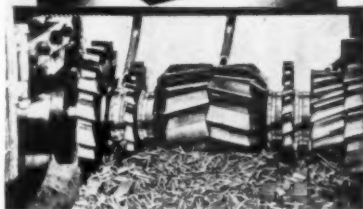
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Alodizing coats aluminum with a hard, thin, tight covering making an excellent base for painting or giving protection against rust. The coat fits so well that it blends in with every movement of the aluminum and does not appreciably alter the dimensions of the treated work. Operating time generally does not run over 2 minutes in a chemical bath at a temperature under 120° F.

A PRACTICAL solution to the problem of protecting aluminum against corrosion and providing a base for a paint coat is Alodine, a product of the American Chemical Paint Company. This is a simple and economical chemical, non-electrolytic method which produces a hard, thin, tight coating. It is applicable to both painted and unpainted aluminum work.

Equipment requirements are modest, and the operating cycle is short. Operating time, generally speaking, does not run over two minutes in a chemical bath at a temperature under 120°F. Sealing as a separate operation is eliminated since Alodizing coats and seals in one operation.

Six specific production-finishing requirements are advantageously met:

1. Effective resistance to corrosion on painted parts or unpainted assemblies.
2. Small amount of processing equipment due to impracticability of installing elaborate electrical equipment for a production-type anodizing set-up.
3. Minimum processing time held within definite or predetermined limits.
4. Necessity for unaltered dimensions of the treated work.

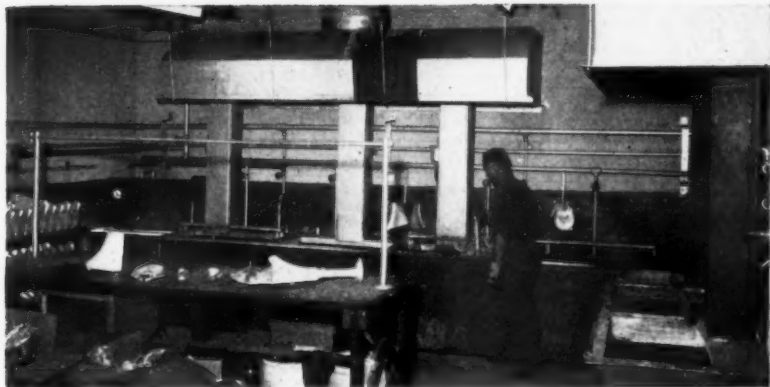


Fig. 1. An operator is rinsing an Alodized aluminum die casting. The immersion technique was selected because of its economy in floor space.

5. Flexible coating for work subject to bending and denting stresses.

6. Treatment of various aluminum alloys, in any combination, in the same solutions.

Although applied most simply by the tank immersion technique, Alodizing is easily adapted to spraying or flow-coating when a continuous operation is desired, as for example, in treating aluminum strip stock. Individual production requirements determine the choice of a particular method.

Following are flow diagrams of two typical processing cycles. Although both routines produce effective protective coatings on painted as well as unpainted aluminum surfaces, Process No. 1 (known as the "Hot-Dry Process") imparts maximum protection to aluminum and its alloys either painted or unpainted. Process No. 2 called the "Rinse Process," is recommended for surfaces that are to be completely painted after Alodizing.

Process No. 1:

1. Preclean (if required).

2. Rinse.

(Steps 1 and 2 may be omitted for generally clean, oil-and-grease-free work.)

3. Treat with Alodine.

4. Dry (Temperature, 280°-350°F.).

5. Deoxylyte-rinse (temperature, 100° - 120°F.) (Recommended before painting only.)

Process No. 2:

1. Preclean (if required).

2. Rinse.

(If aluminum is clean, steps 1 and 2 may be omitted.)

3. Treat with Alodine.

4. Rinse in cold or warm water.

5. Deoxylyte-rinse (temperature, 100° - 120° F.).

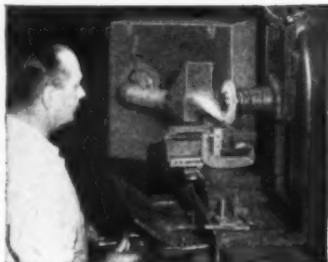
Either of these processing cycles may be carried out (1) by immersion; (2) by spraying moving work; or (3) by subjecting large stationary work to the operations cited.

Equipment required

The requirements of each operation govern the type of processing equipment used.

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Clean Water Rinsing—Tank of mild steel is perfectly satisfactory.

Alodine Treatment—A stainless steel tank is recommended for holding the Alodine solution, and suitable facilities provided for heating the bath to a temperature of 140° F. For the spray process, the requisite stages and drying facilities should be provided in conformance with the flow diagram given previously.

Each stage should be provided with the necessary pumps, piping and spray nozzles for completely spraying the work as it passes through the mechanical washer on the conveyor.

Drying—Where the "Hot-Dry Process" is used, work is dried immediately after Alodizing in an oven at temperatures ranging from 280° to 350° F. For the "Rinse Process" a clear-water rinse in a mild steel tank follows the Alodine treatment.

Deoxylite-rinsing—If parts are to be painted, they are Deoxylite-rinsed in a tank of mild steel construction at a maximum temperature of 150° F. For maximum efficiency, the circulating pump should be equipped with a stainless steel impeller. For final drying prior to application of the paint coating or wax finish, parts are placed in a drying oven or under infra-red lamps at from 100° to 150° F.

Entrapped liquids are blown off the work with dry, oil-free compressed air.

Subject: FILES for LATHE FILING

**"THE
RIGHT FILE
FOR THE JOB"**

conserves materials, saves workmen's time, improves results—cuts production costs. This is one of a series of advertisements on special-purpose files. Save it, with the others, for shop and purchasing references.

Prepared by Nicholson File Co.



Long Angle Lathe File



Mill Bastard File



Lathe Filing

LONG ANGLE LATHE FILE VS. MILL FILE. In the years past, a regular Mill Bastard file was used frequently for lathe filing; and it is still recommended if the filer is not thoroughly experienced, for the Mill file is a little easier to use than the Long Angle Lathe file. However, the teeth of the Mill file have a tendency to fill up with chips. In the Long Angle Lathe file, this difficulty has been reduced by increasing the angle of the teeth from 25° to 45°. The chips slide down the longer angle and are forced out at the edges by the forward motion of the file. Virtually self-clearing, the Long Angle Lathe file does the work rapidly and leaves a smooth finish.

HOW TO USE. In holding the file against work revolving in a lathe, it should not be held rigid or stationary but should be stroked constantly to distribute the cutting action throughout the file. Operator should stand at right angle to his work and be sure his arms and hands are placed so there is no danger of their coming in contact with any moving part of lathe or piece. Pressure should be applied gently at first and increased gradually.

CONSTRUCTION AND APPLICATIONS. Every Nicholson and Black Diamond Long Angle Lathe File is rigidly tested to see that its surface is level and free from hollows that would cause scratches or grooves in the work. Made in Flat type, with "Long Angle" stamped on shoulder.

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MACHINE TOOL CO.**

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CINCINNATI 2, OHIO**

Work baskets or processing crates are constructed of stainless steel. Also it is important to equip all tanks with skimming troughs and bottom drains for thorough cleaning periodically.

Precleaning of work

Where corrosion-free aluminum or an aluminum alloy of any analysis has previously acquired an excessive amount of drawing compound, machining lubricant, fabricating oil or other similar surface contaminant, pre-cleaning of work always precedes Alodizing. A well-buffered alkaline-base composition capable of removing oil without etching the surface is used for this purpose. The cleanser should be applied as recommended by the manufacturer.

Following precleaning, parts are thoroughly rinsed by both immersion and spraying to prevent excessive neutralization of the Alodine bath by alkaline carry-over into the solution. The most preferable practice, however, is spray application of a phosphatic cleaning agent. The mechanical action of the solution impinging on the metal surface increases the desoiling effectiveness of this type cleanser.

Composition of the individual alloy in process governs the choice of phosphoric acid materials utilized for cleaning and conditioning corroded work. On alloys free from copper, for example, an emulsion-type compound may be used effectively at 140° F. in a spray process, or another grade of this group of cleaners may be diluted with water and used at room temperature as a brush-on, wipe-off process where no rinsing facilities are available.

For cleaning corroded copper bearing alloys, a still different Deoxidine-type cleaner is applied by a hot immersion process. This conditioner is then followed by (1) a suitable nitric acid bright dip to remove copper smut formed by reaction with the copper bearing aluminum alloy; and (2) a thorough rinse before the Alodizing treatment.

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Photo courtesy
Concrete Surfacing Mach. Co.
Cincinnati, Ohio

The concrete surfer shown above makes clear the advantages of flexible shaft driven portable tools.

With the motor suspended from the operator's shoulder, or mounted on a movable stand, tool holders can be made smaller and lighter. This means easier manipulation over a wider range and with less fatigue.

There are still many industrial operations being performed by hand which could be done faster, better, and more economically with a flexible shaft machine designed for the purpose. S.S.White offers its cooperation in applying flexible shafts to these developments.

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It gives facts and engineering data about flexible shafts, their selection and application. Free copy sent if you write for it on your business letterhead and mention your position.



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THE S. S. WHITE DENTAL MFG. CO.

INDUSTRIAL

DIVISION

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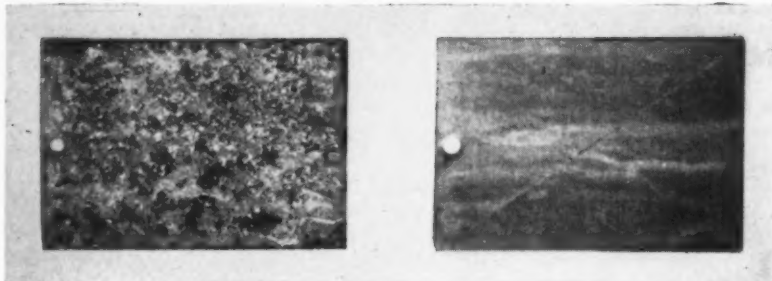


Fig. 2. Unpainted aluminum panels subjected to salt spray after being solvent wiped with mineral spirits (left) and anodically oxidized (right).

Preparation of Alodine bath

Three grades of the aluminum-processing chemical are used in the make-up, operation and maintenance of this non-electrolytic bath for coating aluminum. Typical preparation directions are given below.

For each 100 gallons of solution, 10 gallons of the liquid Alodine and 18 pounds of Alodine make-up powder are poured into the tank. Then 90 gallons of water are added and the solution mixed. Conditioned for use with scrap aluminum, the Alodine bath is maintained at a temperature of from 110° to 120° F.

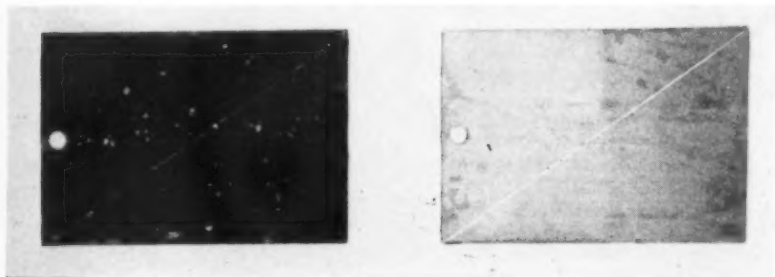
Treatment of work

Process used (spray, dip, tumbling barrel, or flow-coating means) is determined by the quantity of output required and size and shape of parts.

Parts are submersed with crates, hooks, racks or any device that permits free circulation of the solution. Small parts may be processed in stainless steel tumbling barrels. An effective coating is produced in from 1 to 5 minutes, after which parts are drained over the processing tank from 30 seconds to 1 minute.

When the spray technique is used, the work is hung on the conveyor and

Fig. 2a. Unpainted aluminum panels subjected to salt spray after being chemically oxidized (left) and Alodized (right).



Special **CARBIDE TOOL GRINDER**

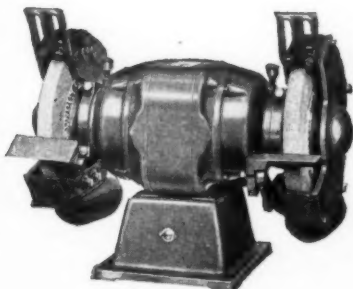


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BALDOR GRINDER, series 500, (shown above) is the newest development in grinders designed and fully equipped for sharpening Carbide Tools quickly and accurately; has sturdy $\frac{1}{2}$ H.P., reversible, ball-bearing motor. 6" Silicon Carbide wheels; adjustable tool-rest tables, water pot. Complete as illustrated and GUARANTEED 2 YEARS against burn-out.

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AT LEFT: BALDOR Bench Grinder, No. 101. $1\frac{1}{2}$ H.P., ball-bearing motor; 1725 rpm; 10" Aloxite wheels; adjustable tool rests.

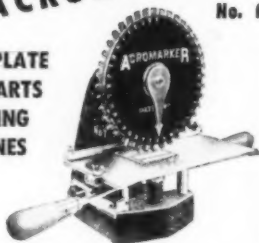
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ELIZABETH 4, NEW JERSEY

carried through the various processing steps.

Preparation of bath

Solution is lost from the processing tank either through dragout, which lowers the bath level and reduces the amount of water and Alodizing chemicals uniformly, or by reaction with the metal, which reduces the amount of the chemical constituents of the solution without changing the level of the bath. Although a new, unused bath produces a coating, the best processing procedure based on plant experience generally calls for immersing some scrap aluminum in a fresh bath for 30 to 60 minutes in order to "age" it prior to production use.

To maintain the bath at its proper strength, it is analyzed at regular intervals and additions made of Alodine liquid and replenishing powder as indicated by the test. Detailed instructions for handling these operations are furnished by the manufacturer to Alodine users.

In the operation of the bath an accumulation of insoluble salts gradually separates as sludge, settling to the bottom of the tank. Periodic removal of this sludge is necessary. To desludge the tank, the bath is first allowed to cool and settle, and the clear liquid is then decanted off. The liquid thus salvaged, which amounts to approximately 80 per cent of the total volume of the bath, may be reused after the proper additions are made. This practice eliminates aging the rejuvenated bath.

Drying work immediately after Alodizing

Work that is to be left unpainted or only partially painted is transferred from the Alodizing solution, after draining, to a drying oven. The temperature is maintained between 280° and 350° F., for one to two minutes.

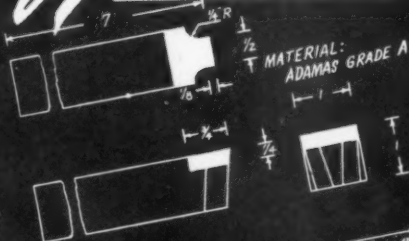
Where specifications call for painting or waxing of work, the additional

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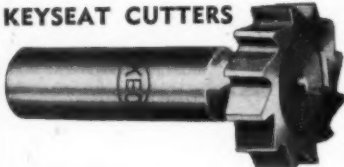
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KEO CUTTERS

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operation of warm Deoxylite-rinsing is required. Parts so prepared can be painted over the entire surface. The customary preparatory treatment for painting, however, is the following sequence.

Rinsing after Alodizing

As shown in the second flow diagram for processing parts that are to be painted, a fresh water rinse follows the Alodizing treatment.

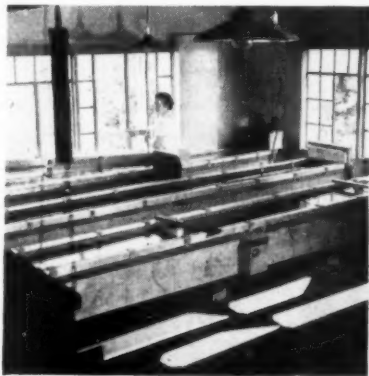
Parts are either immersed for from 30 to 60 seconds in cold or warm clear water, or spray-rinsed from 30 to 45 seconds. Surface of the rinsing solution should be maintained in clean condition at all times. This is easily accomplished by a continual flow of water over the skimming trough.

Deoxylite-Rinsing

A 15-second submersion of parts in a heated Deoxylite solution precedes the application of an organic finish. Use of the recommended acid addition agent provides a precise adjustment of pH, counteracting the alkaline material and soluble salts present in the rinse

• • •

Fig. 3. A typical Alodizing installation of aluminum awnings is illustrated here.

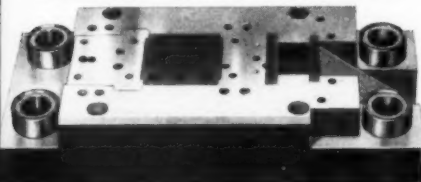
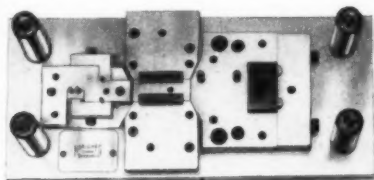


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water. It leaves the surface of the work at the proper pH required for tenacious adhesion and long coating life.

This bath is heated to a temperature ranging from 100° to 120° F., and the pH is maintained between 3 and 5½. A new bath is made up at least once every day.

Drying and Painting

Following application of the warm acidulated rinse just described, parts are dried in ovens or with infra-red lamps at a temperature not exceeding 150° F. This temperature is considerably lower than that required for drying Alodized work not rinsed prior to drying.

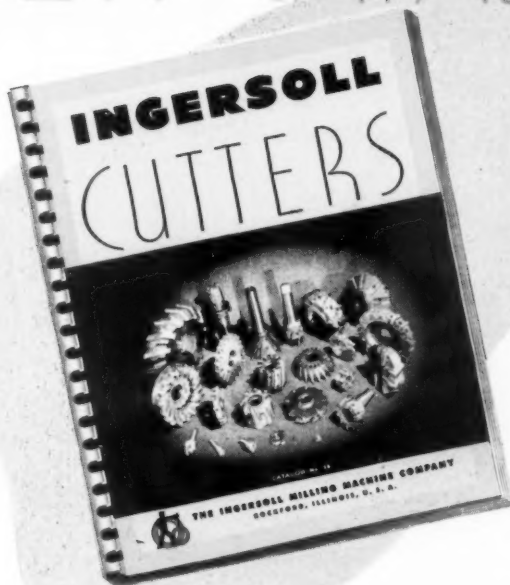
Moisture is blown from crevices, pockets and recesses with dry, oil-free compressed air. Any moisture that splatters is wiped off the work with clean cloths. The work is now handled only with clean rags or gloves to prevent resoiling with fingermarks or perspiration.

The organic coating should be applied as quickly as possible to prevent deposition of impurities from handling. And, of course, it should be dried or baked strictly in conformance with the manufacturer's recommendations.

Many details have been necessarily skipped over or touched upon only lightly, but it is hoped that the data presented in this digest of an important new corrosion-proofing and paint preparation process will have proved of interest and value to those plants and shops now working with aluminum, many of them for the first time. The End.

"Alodine," "Deoxylite," "Deoxidine,"
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Photographs through courtesy American
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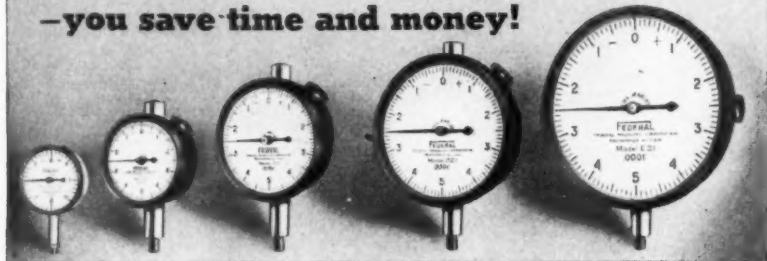
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Letter from England



Written for the **MACHINE** and **TOOL BLUE BOOK** by Robert Hutcheson, Editor of **MACHINE SHOP MAGAZINE**, London, England.



The General Electric Company Ltd., have been conducting research into the process of cold welding. Cold welding is not a new process but this new research has been in the direction of joining aluminium and ductile aluminium alloys. In this process the parts to be joined must be thoroughly cleaned so that positive metal to metal contact is obtained and then they are subjected to a high pressure at the position where the weld is to be made. It is merely necessary to squeeze the parts between a pair of dies of a shape corresponding to the shape of the weld required. Welding is done in any suitable form of press and in view of the high concentration of pressure over a small weld area, comparatively light presses can be used. Seam welding can be performed by passing the work between a pair of rotating dies somewhat similar to the procedure adopted for seam welding on a resistance welding machine. The extension of the cold welding process to aluminium and its alloys opens up considerable possibilities and it has also been found possible to weld copper to aluminium.

An event which aroused great interest throughout the country this month was the unveiling of the Roosevelt Memorial Statue. The statue was modelled by Sir William Reid Dick, K.C.V.O.; R.A. who commenced by making a clay model about one third

of the full size of the finished statue. From this a full size clay model was developed by Sir William and the statue itself was cast in sections by the lost wax process. The various sections of the final casting were carefully fitted together and secured by screws, the joints between the parts being peined to give a continuous surface to the outside of the statue. As a final process the statue was thoroughly cleaned and given a green colour by patination, the green colour harmonizing with the surroundings in Grosvenor Square where the statue forms the centrepiece of the Roosevelt Memorial.

Major developments are taking place in the works of the Steel Company of Wales Ltd. At their Abbey Works a three-stand cold reduction mill is to be installed. It will be built to the east of the hot mill finishing departments and the hot reduced coils will be transported to it by conveyors which will be 1,000 feet long. It is estimated that the initial output of this plant will be 5,000 tons per week rising to 7,000 tons or more by the addition of further annealing plant.

Figures published for March show that steel production during that month reached a new high record. The weekly average was 290,000 tons which is the equivalent of an increase in annual production of

68,000 tons over the annual rate of production in February. Pig iron production during March shows an increase on the annual rate of production of 134,000 tons more than the rate for February.

The air speed record for the international 100 kilometres closed circuit was broken on the 12th April by John Derry, a test pilot employed by the De Havilland Aircraft Company. Flying a De Havilland 108 jet aircraft, which is a tailless monoplane, his average speed was 605.23 miles per hour with a top speed of 635 miles per hour. The D.H.108 is an experimental machine designed to test the possibilities of high speed flight with swept-back wings, the data obtained from its tests being required for the D.H.106 air liner which is powered by four pure-jet engines.

Exports from the United Kingdom reached a new high level in March. The largest increase was for vehicles the value of which was over £20,000,000. Machinery generally was up to £19,700,000 while coal exports also leapt up. Figures published for the first quarter of 1948 show that machinery

exports were up by £5,400,000, vehicles were up by £4,900,000 and articles manufactured from iron and steel were up by £900,000. On the other side of the balance sheet, however, our imports during March were almost a record figure.

Export of engineering equipment is not without its difficulties. G. A. Harvey & Company (London) Ltd. recently completed a flash fractioning column that has been shipped to an oil refinery in Venezuela. This column is 83 feet long and 10 feet 4 inches diameter with a weight of 108 tons and we understand that they are building two more. One of the major problems concerning the export of this column was in getting it from the works to the ship which was one mile away. It was impossible to take a direct route and so it was taken a roundabout journey for a distance of 38 miles. The route had been carefully planned because not many London streets or the bridges over the River Thames will permit the manoeuvring of such a load. The journey was made on a Sunday when London traffic was at a minimum.



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- The exact speed required for drill diameter and material at the turn of a knob.
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**WRITE FOR BULLETIN DE-
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THE TAYLOR & FENN CO. HARTFORD 1, CONN.

Argentina is developing its own aircraft industry and one step in this direction is an agreement with the Rolls-Royce Company for the Argentine government to build the Derwent gas turbine engines in Cordoba. A Commission from Argentina is at the Derby works of Rolls-Royce studying the technique of engine manufacture while Rolls-Royce engineers are in Argentina advising on the equipment of the works at which the Derwent engines will be made.

The Argentine Government is also ex-

tending its merchant fleet and is now considering specifications for four tankers each of 18,400 tons which are to be built by Cammell Laird of Birkenhead and to be delivered in 1951.

Harking back to the steel industry, the Scrap Investigation Committee has made a preliminary report and in view of its recommendations attempts are being made to obtain extra scrap from Germany. The Iron and Steel Board, according to Mr. George Strauss, the Minister of Supply, have examined and passed 526 schemes for the development of the industry. About another 70 schemes were under examination. If all these schemes are put into practise the result will be a very large expansion and modernization of the British steel industry.

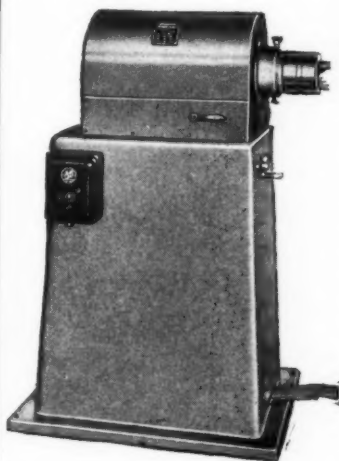
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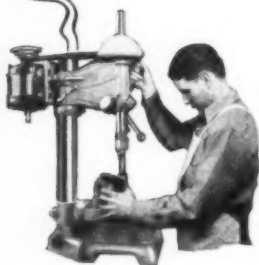
Production records prove that Schauer low-cost Speed Lathes save time • increase production • lower operating costs • afford greater efficiency and faster handling of parts requiring De-burring, Filing, Lapping, Polishing. There is a size and type of Schauer Speed Lathe for almost every secondary finishing operation. Write for Catalog 480.

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2064 Reading Road Cincinnati 2, Ohio

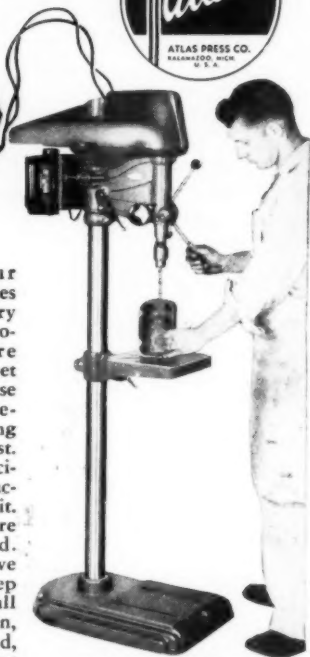
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BENCH DRILLS
\$69⁰⁰**



**15"
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ATLAS PRESS CO. 650 N. PITCHER ST. KALAMAZOO, MICHIGAN

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For Making Motor Laminations

By replacing notching dies with multiple-piercing dies in the manufacture of motor laminations the Reliance Electric Co. is able to show substantial savings in die costs. Production has also increased; further, four punch presses have been freed for other jobs.

USE OF multiple-piercing dies to replace the notching method for making motor laminations is a comparatively new production technique at the Marine Division plant of The Reliance Electric & Engineering Company, Cleveland, O.

First conceived by tool engineers in 1944, the original multi-slot die program provided for making a total of 12 dies—each for 1800 rpm A-c. motor stator and rotor laminations. Economic justification for these multiple-piercing dies are compared to notching was determined on two counts: (1) a cost of \$3,000 per die; and (2) yearly production of laminations sufficient to return die investment in savings realized over a period of from two to three years.

On the basis of a single notching die cost of \$150 for the stator and armature and \$100 for the rotor, Reliance engineers arrived at 765,000 stator laminations, 1,290,000 rotor laminations, and 940,000 armature laminations, as the respective quantities which would have to be made before the die expenditure in each case could be justified. It was also found that each die used would free four notching presses for other vitally-needed production, thus smashing a bottleneck in punch press capacity.

Results secured to date have far exceeded the company's expectations. In fact, the multi-slot dies have proved so successful in production practice that the original program developed by the tool engineering department has twice been revised upward since 1944. When completed later this year, 25 multi-slot dies will be in use.

There are multiple-piercing dies of many types in wide use throughout the metalworking field today, of course, and all have a definite place and serve a specific purpose in the scheme of things. At Reliance, the tool engineering program involved the determination of multi-slot design and manufacturing practice best suited to meet the requirements presented by punching of laminations in a Minster 45°-inclined adjustable-speed press of 100-ton capacity.

The die design is based on perforating slots in a blank previously formed in

another operation. The blank takes the shape of a doughnut for stator laminations and the form of a disc for rotor laminations. A nest is used to center or locate the blank in the multi-piercing die. Stators are slotted and notched on the outside diameter, while rotors are slotted and have a center hole punched out simultaneously.

Punch members are secured in place by a low-melting temperature alloy (lead bismuth) having a negative coefficient of expansion which firmly locks the punches in place in a novel retainer. Punch and retainer assembly are so constructed as to compensate for wear with the removal of "shim" plates. This construction provides a minimum of punch projection beyond the retainer necessary for rigidity.

For alignment with dies, punches are coated with a special synthetic resin equivalent to clearance between punch

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and die. This innovation in alignment technique, a Reliance development, permits accurate alignment of dies without the need of accurately indexed machine tools or costly special equipment. Compared to conventional die alignment

practice, which prescribes accurately made spiders or precision work on the die, this coating method is decidedly more economical.

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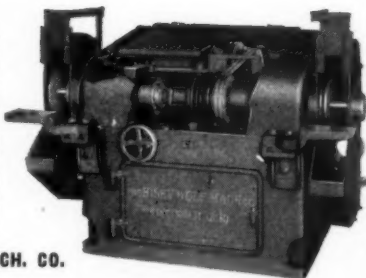
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hanite and have four guide pins and bushings, made of bronze and oil-lubricated. Dies have floating type positive knock-out strippers actuated by a cam built into the VS-equipped Minster press. Stripper action, delayed, operates at top stroke of the press, permitting each punching to fall clear of the nest.

Made of high carbon, high chrome tool steel, hardened to a Rockwell C rating of 63 to 64, these multi-slot dies measure 20" x 20". Blanks and punchings produced from high-silicon electric sheet 26 gauge (.019") range in size from 4 3/4" (rotor) to 12 1/8" (stator) for 1 to 15 hp. motor frame sizes for 4 and 6 pole ratings (NEMA frame sizes 200 through 320).

Although these multi-slot dies are designed to produce 5,000,000 punchings for a maximum grind of 1" of die length, accumulated production experience shows that the dies exceed this life expectancy by a substantial margin. Best die produced to date, for example, already has turned out some 11,000,000 punchings and is still "going strong".

In addition to providing the anticipated production economies, the use of multi-slot dies by Reliance has made possible faster operation and higher volume than were previously obtainable with notching press equipment. Output of punchings per grind is greater. Presses operate on a virtually continuous schedule. Also, quality studies have shown that less inspection per unit is required. Equally important, multiple-pierced laminations contribute to more efficient performance of the end product.

The basic economics of punch press operation, as with any machine tool operation, depend to a large extent on die design and construction. When the job is properly planned and tooled, high productive efficiency is achieved and maintained at low unit costs. **THE END.**

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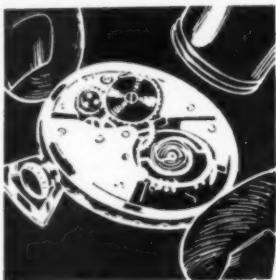
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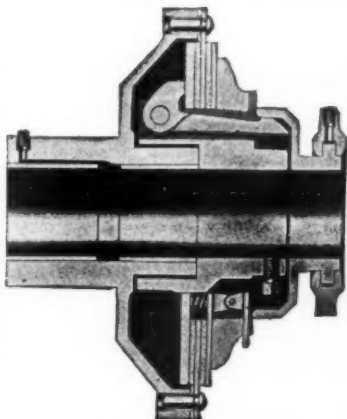
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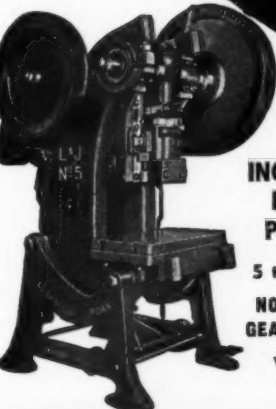
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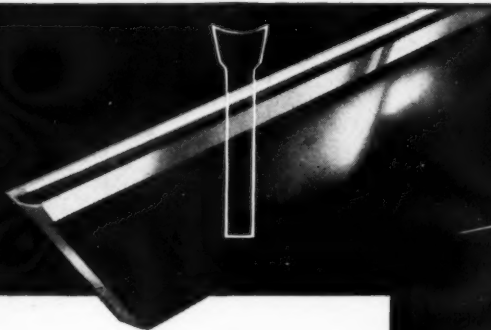


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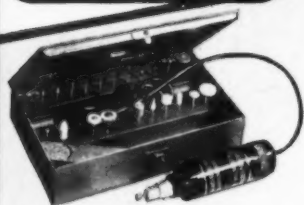
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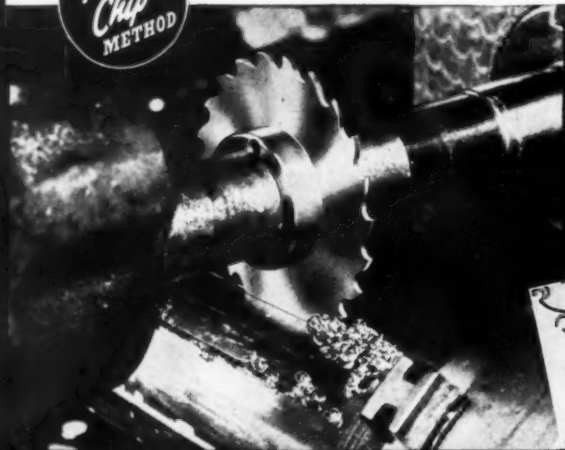
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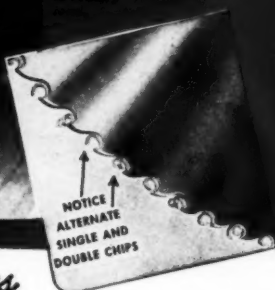
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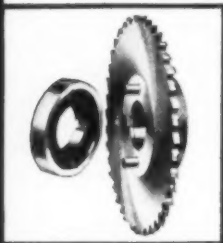
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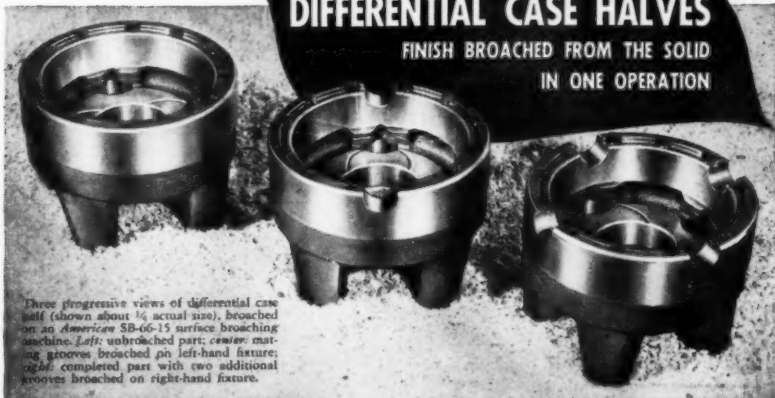
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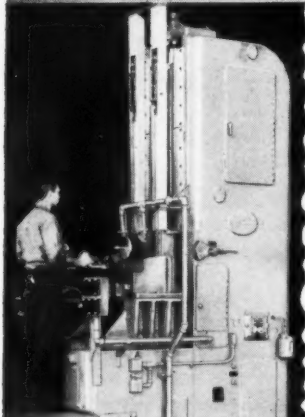
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DIFFERENTIAL CASE HALVES

FINISH BROACHED FROM THE SOLID
IN ONE OPERATION



Three progressive views of differential case half (shown about 1/4 actual size), broached on an American SB-66-15 surface broaching machine. Left: unbroached part; center: mating grooves broached on left-hand fixture; right: completed part with two additional grooves broached on right-hand fixture.



American SB-66-15 surface broaching machine tooled for broaching differential case halves. Interchangeable locators are provided for broaching either the large part shown or the mating half.



Finish broaching from the solid is an important advantage of this American engineered job. On this American single ram pull down machine, a full 66" stroke is used in broaching differential case halves. Half round mating grooves are rough and finish broached from the solid in one pass.

The malleable iron parts are first located in the left-hand fixture, with location taken from boss and counterbore, and index from flange hole. Location for second pass on right-hand fixture is also taken from boss and counterbore, and index from the previously broached slots.

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This unit duplicates a previous installation which has broached these automotive case halves to the customer's satisfaction for over ten years.



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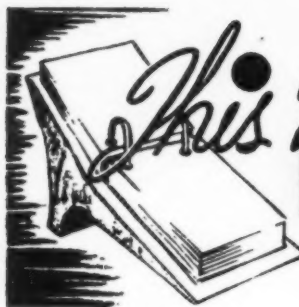


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Obtainable from Motion Picture
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Application to aluminum products of the various finishes for aluminum — mechanical, chemical, electrochemical, electroplated and organic — is pointed out. While the picture discusses briefly how these finishes are applied, it cannot be considered a how-to-do-it picture. It is designed primarily to acquaint architects, designers, buyers, manufacturers, and others interested in aluminum, with the many and varied finishes for the metal and to give them ideas for new applications they may be con-

sidering. Eye appeal and sales appeal are important in the case of some finishes, while in other instances the durability of the finish is a distinct asset. The picture explains pictorially the reasoning behind the finish and why each type of finish is employed.

When writing for film, size of film desired and a first, second, and third choice of dates should be given. Requests should be made at least two weeks in advance.

There is no charge for the use of the picture, but the borrower is expected to pay transportation costs both ways and for loss or damage to the pictures, other than ordinary wear.

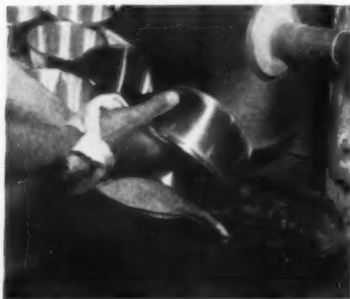
BRAZING CARBOLOY CEMENTED CARBIDE TOOLS

Carboly Co., Inc.
Detroit, Mich.

30 Minutes. Slide films. 35mm. Obtainable from Carboly.

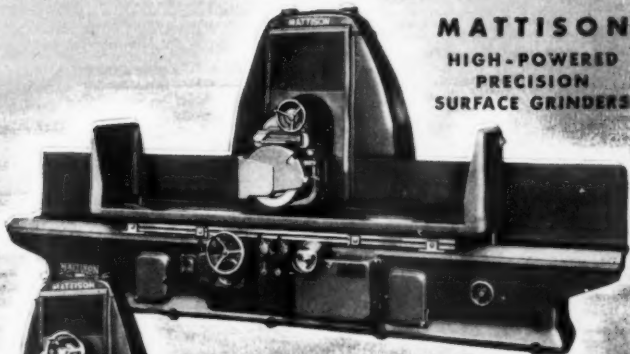
Carbide blanks are torch brazed into steel shanks in a detailed, step-by-step procedure. Single and multiple point tools are brazed, and special method for renewing wornout H. S. S. cutters by brazing on carbide tips is shown.

The film tells how tips are secured to the shank of the tool in the ordinary



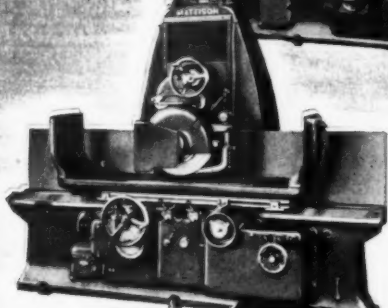
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FIVE TONS of smooth power is at your service with this compact and versatile tool.

The perfect press for garage, electric motor shop, refrigerator repair and machine shop.

Will operate lying horizontal.

Ram has removable anvil and retracts itself when released.

Stroke $5\frac{1}{2}"$

Weight 100 lbs. *



ARTHUR J. HURT & CO.

360 SOUTH NAVAJO STREET
DENVER 9, COLORADO

ATLAS UNIVERSAL JOINTS



Joints may be fitted to specification, or with —

- round bore
- key-way
- square hole
- shoulder

Fitted to exact specification of a guaranteed saving per unit.

- Short stubby jaws for maximum strength and economy of space
- Made from heat treated alloy steel for maximum physical properties
- Bearings located maximum distance from joint center, cutting bearing load and wear
- Sizes over $1\frac{1}{2}"$ O.D. have grease reservoir, an Atlas exclusive
- Send blueprint for quotation, or write for catalog. Large stock on hand



GRAY & PRIOR MACHINE CO., HARTFORD 3, CONN.
130 SUFFIELD STREET
In the West: Link Belt Co., Los Angeles, San Francisco
Portland, Seattle, Oakland, Spokane, Dallas

braze, and the various methods of brazing. Necessary equipment and accessories required for torch brazing and brazing procedure, including preliminary steps like selecting the proper torch tip and the correct brazing flame, are discussed. It also covers special brazing



method for steel cutting tips, tips irregularly shaped or enclosed, tips larger than $3/4"$; how to braze Carbonyl tips to used high speed steel shanks; requirements and steps in brazing multi-point tools; and how to remove tips from single and multi-point tools.

TO GREATER VISION

Bausch & Lomb Optical Co.
Rochester 2, N. Y.

28 minutes. *Black and White. Sound. 16 mm. Obtainable from Bausch & Lomb.*

This is the story of the manufacture of glass for use in optical instruments and eyewear; it demonstrates the optical principles involved; and it shows applications of instruments in science and industry, peace and war. Shown is the mixing of raw materials for optical glass, the melting in huge pots, the pouring and the cooling, precise grinding and polishing operations that produce optical elements of perfection and the testing that requires measurement to millionths of an inch. Rays of light demonstrate their behavior as they enter and leave prisms and lenses of optical glass. Reflection, refraction, focus and dispersion are explained. It

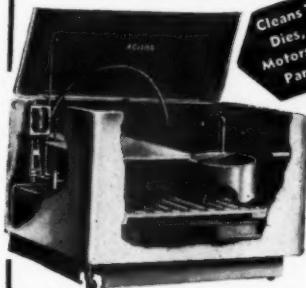
shows how the scientist works with his microscope and how the technician uses a spectrograph to determine the



composition of a substance or a metallograph to learn its structure.

Importance of optical glass to America at war and the part that it plays in the aid of vision are explained. The intricate tests in the examination of the eye are shown and instruments used to

EVERY MODERN FACTORY NEEDS THIS FAST, EFFICIENT COLD PARTS CLEANING SYSTEM



Cleans Tools,
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Motors, Engines,
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GRAYMILLS CORPORATION
1945 RIDGE AVE., EVANSTON, ILL.

FIGURE THE TIME YOU SAVE

With Nicholson
EXPANDING MANDRELS



Set of 14 does the work of 209 solid arbors. Not infrequently, time studies show operations are completed in less time than was formerly consumed in looking for or turning a solid arbor. For all bores $\frac{1}{2}$ " to 7". Hardened tool steel. Sold singly or

in sets. Used in shops the nation over.

Test the time-saving possibilities of these precision tools. BULLETIN 1043.



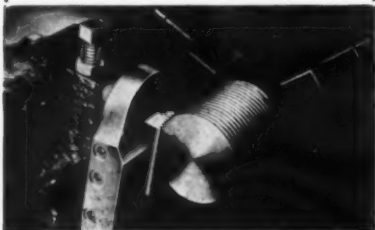
TYPE A—Step jaw design. Especially adapted for holding work with short bores; for hexagonal branched holes as well as round.

W. H. NICHOLSON & CO.

117 Oregon St., Wilkes-Barre, Pa.

K-J THREAD CHASING HOLDER

ONE OF THE 14 K-J LATHE TOOLS



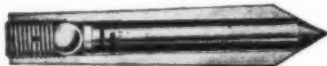
Designed to accommodate standard commercial-type chasers . . . far superior to hand ground chasing tools. Also used on large diameters where die-heads are not practical. Write for free illustrated literature on this and other K-J tools.

KYLE - JOHNSON MACHINE COMPANY

1627 W. Pico Blvd., Los Angeles 15, Calif.

REVOLVING TIP LATHE CENTERS

★ ★ *by*



- Runs cool and yields under load to compensate for work expansion
- Same dimensions as standard solid centers
- Saves time—saves money—saves work & outlasts 10 ordinary centers.

**Lowest Priced
Live Center
on Market**

\$6.25

**No. 2 Morse
Taper Shank**

**No. 3—\$7.75
No. 4—\$9.75**

ASK YOUR DEALER FOR DETAILS

ERNEST H. VANDERWALL CO.

440 Golden Gate Ave.
San Francisco 2, California

make them demonstrated.

This is a film of general interest, but has a distinct scientific value.

MILWAUKEE FIRM ANNOUNCES REVISION

It was recently announced that beginning May 1, 1948, the Screw Machine Tool portion of Fred C. Paatsch Company of Milwaukee, Wisconsin, will operate under the name of Screw Machine Tool & Supply Co., a division of Fred C. Paatsch Co., devoted to serving the screw machine industry.

The firm is agent and distributor for Boyar-Schultz Corp., Lipe-Rollway Corp.—Pneumatic Bar Feed Div., Masterform Tool Co., Reed Rolled Thread Die Co., Screw Machine Tool Co., (Slitters), Sheffer Collet Co.

TAFT-PEIRCE APPOINTS AGENT

The Taft-Peirce Mfg. Co., Woonsocket, R. I. has announced H. Wilson Ryno, 1060 Broad St., Newark, New Jersey, has been appointed the Taft-Peirce agent in Newark.

GROOVED RACE BALL THRUST BEARINGS WITH BRONZE ★ RETAINERS ★



Sizes of these bearings range from 1/2" to 3 1/2" shaft diameter; from 1-7/32" to 5-7/32" outside diameter. These sizes are carried in stock. Larger sizes can be made to 25" O. D.

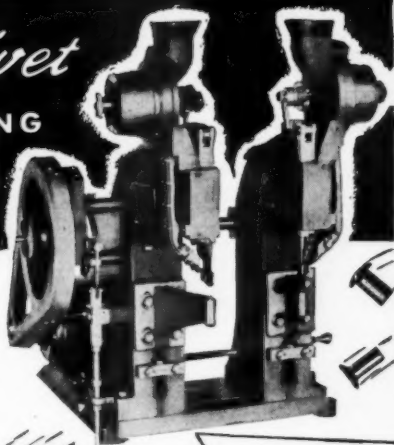
ACORN BEARING CO.
66 Stanley Street New Britain, Conn.
NO EXPORT

Chicago Rivet

AUTOMATIC SETTING

SLASHES UNIT COSTS!

If your product involves a fastening operation — wood to wood, metal to metal, fabric to fabric, composition to composition, or any combination of these — you can slash unit costs by increasing production volume with high speed Chicago Rivet Automatic Setters and Chicago Rivet tubular or split rivets. Four rivets are automatically fed, inserted and upset at one release of the foot pedal by the quadruple model Chicago Rivet Setter. Single, double and triple setters are also available.



Bench type
Double Rivet
Setter with
Adjustable
Riveting
Centers

A Few Applications

AIRPLANE PARTS
AUTOMOBILE PARTS
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FARM IMPLEMENTS
FILING EQUIPMENT
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GARBAGE CANS
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LOOSELEAF BOOKS
LUGGAGE
MILK BOTTLE CRATES
NOVELTIES
POTS, PANS & PAIRS
PULLEYS
RADIO PARTS
REFRIGERATORS
RUBBER GOODS
SEWING MACHINES
SHOES • SKATES
STEP LADDERS
STOVES
TELEPHONES
TOASTERS • TOYS
TYPEWRITERS
VENTILATORS
WASHING MACHINES

Quick change hoppers, available as extra equipment, enable some models to switch quickly from one size and style rivet to another. Nearly all models clinch grommets, eyelets, staples and Dzus fasteners and insert drive screws — all automatically.

FREE FASTENING CLINIC

If your product is small, send us an unfastened sample. If it's large, send a sub-assembly. We will gladly analyze your fastening problem, recommend the type rivet and Chicago Rivet Automatic Setter needed and estimate production rates that can be set up on the job.

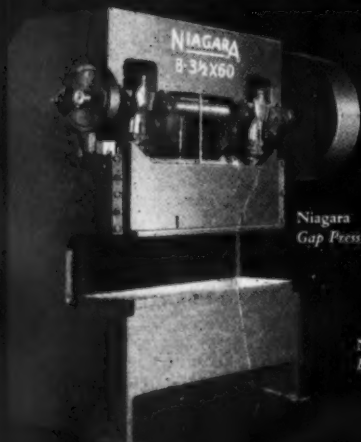
Chicago Rivet

CHICAGO RIVET & MACHINE CO.
9610 W. Jackson Blvd., Bellwood, Ill. (CHICAGO 501444)

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

NIAGARA

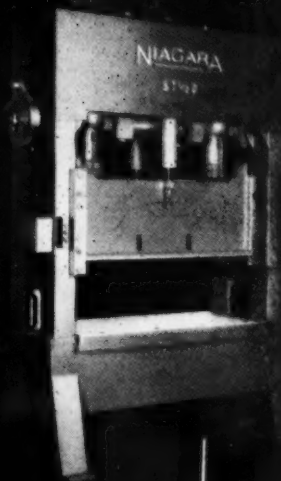
PRESSES, SHEARS,
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Niagara
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NIAGARA MACHINE AND TOOL WORKS, BUFFALO 11, N. Y.

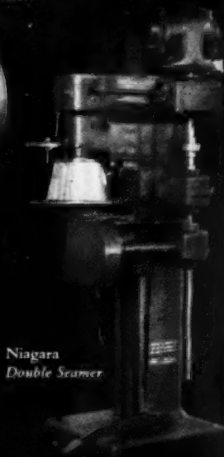
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MACHINES *and* SHEET METAL

Operations including shearing, blanking, punching, forming, flanging, beading, corrugating, seaming and many others are being done quickly, economically and accurately on Niagara machines. Niagara machines and tinner's tools on these pages are just a few of the hundreds of types, sizes and capacities which make Niagara America's most complete line. Write for helpful bulletins.



Niagara
Horn Press



Niagara
Double Seamer

District Offices: Detroit, Cleveland, New York

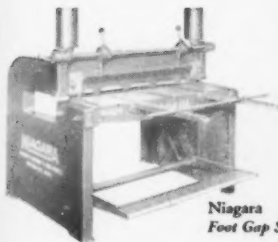


Niagara
Ring and
Circle S

Niagara
Rivet Set and Header



Niagara
Hollow Punch

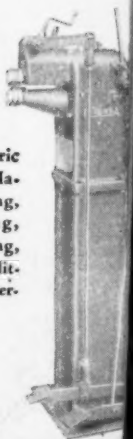


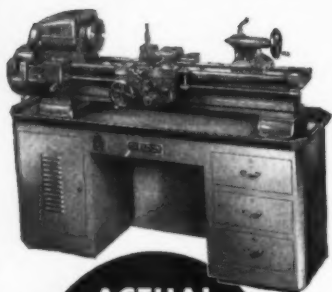
Niagara
Foot Gap Shear



Niagara
Snips

• Niagara Electric Combination Machine for burring, turning, wiring, beading, crimping, elbow edging, slitting and other operations.

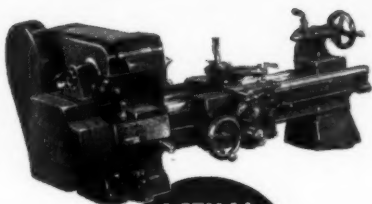




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L-44
10 1/4" SWING

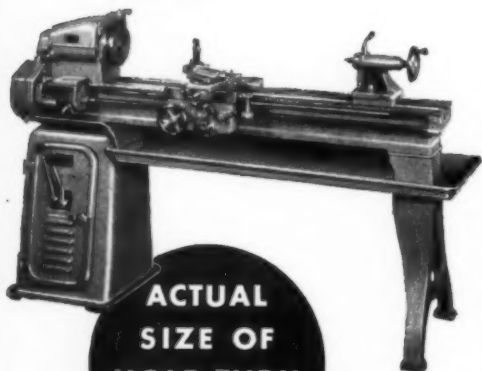
**ACTUAL
SIZE OF
HOLE THRU
SPINDLE**

SHELDON
TRBS-56
11 1/4" SWING



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Add a **SHELDON** for profit



**ACTUAL
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SHELDON
TU-1248P
13 1/4" SWING

Increase your profit on ordinary lathe work (diameters to 12") by using smaller, faster, handier and extremely accurate SHELDON Precision Lathes. Eliminate excessive tool investment, excessive power consumption. Save floor space. Save your large equipment for really big work.

The SHELDON Lathe, with "Zero Precision" Taper Roller bearings will work to the closest tolerances, will operate efficiently at full capacity and hold its extreme accuracy long after it has paid off its moderate cost.

SHELDON MACHINE CO. Inc.

Manufacturers of Sheldon Precision Lathes • Milling Machines • Shapers
4242 N. KNOX AVENUE • CHICAGO 41, ILLINOIS. U. S. A.

WHAT'S NEW IN METALWORKING

NEW CINCINNATI NO. 2 CUTTER AND TOOL GRINDER

Many improvements have recently been incorporated in the No. 2 Cutter and Tool Grinder, built by The Cincinnati Milling Machine Co. Grinding wheel spindle bearings are the pre-loaded precision anti-friction type, packed in grease for life-time lubrication. Dual hand table traverse knobs, usually located at the rear of the machine, are now duplicated at the front. The operator now has table traverse control at every possible operating position; at the front, right- and left-hand corner of the bed; behind the table, right- and left-hand side of the bed.

Vertical adjustment of the grinding wheel head has been increased 3 in. to a total of 10½ in. This increases the versatility of the machine in grinding large cutters, especially those mounted on the Face Mill Grinding Attachment.

Electrical controls are built-in, recessed in a front compartment. A disconnect switch, operated by the latch handle on the electrical compartment door, shuts off the current when the door is opened. Additional safety will be found in the transformer unit included with the controls for shops operating on high voltages. It reduces the voltage to 110 at the

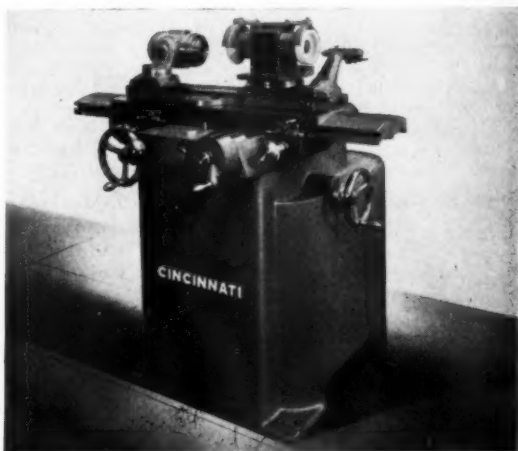
push-button station. Push buttons are also built-in. They consist of start and stop buttons for plain and universal machines; in addition, universal machines are equipped with a two-way switch for the Cylindrical Grinding Attachment motor.

Daily lubricating requirements have been greatly reduced. Nine separate lubrication points are now serviced by a built-in reservoir and plunger pump.

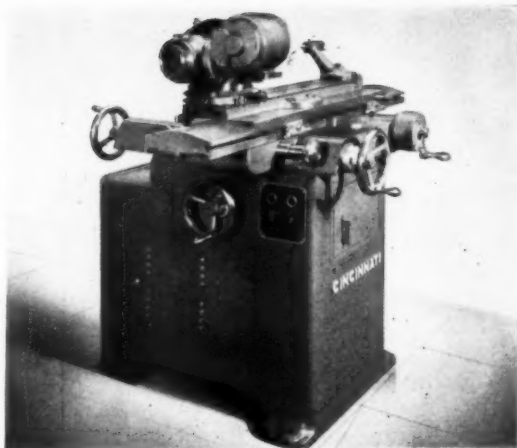
In addition to the Face Mill Grinding Attachment, Long Reamer Grinding Attachment, Spring Collets, etc. — two

• • •

Front view of Cincinnati's new No. 2 Universal Cutter and Tool Grinder.



types of "wet" grinding attachments are also available. One is for cylindrical grinding operations; it incorporates a motor driven pump and tank unit, built into the machine base, and includes splash guards around the table and wheel. The other attachment, separate from the machine is for carbide grinding operations. A motor driven coolant pump and tank, and an air suction pump, are combined into one unit. A thin stream of coolant, directed to the wheel, is disintegrated into drops by the rapidly revolving wheel. The air suction returns the moisture to the tank, keeping the table and machine dry while the wheel and work are clean and cool.



Side view of Cincinnati No. 2 shows built-in push buttons and motor compartment covers.

• • •

The other standard features of the Cincinnati No. 2 Cutter and Tool Grinder have been retained, including the anti-friction table slide, which traverses at almost zero effort. The slide and saddle are fitted with hardened and ground ways. A $\frac{3}{4}$ h.p. motor, mounted on the lower end of the wheelhead column, drives the grinding wheel spindle through the medium of an endless flat belt. To exclude dust, the wheelhead column is encased by an ac-

cordion type rubber guard. Vertical adjustment handwheels on both sides of the bed facilitate the grinding of right- and left-hand cutters, and cross adjustment handwheels at the front and rear aid the operator in setting up the machine.

Additional information may be obtained by writing for catalog M-1618. The Cincinnati Milling Machine Co.
Dept. BB
Cincinnati 9, Ohio.

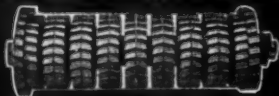
CUT YOUR COSTS! (THE EASY WAY)

Send your cutting tools in today for Sharpening, Salvaging, Reconditioning.

SAVE UP TO 70%

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TOOL SERVICE

DETROIT 3, MICH.

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THE LEACH 6 x 12 SURFACE GRINDER

**DOES THE WORK
OF LARGER, MORE
EXPENSIVE MACHINES**

...AND

LEACH

CAN PROVE IT!

New in conception, low in price, BIG in performance — the Leach 6 x 12 is a bear for work. Actually handles over 90% of the work of larger, far more expensive machines. The Leach 6 x 12 Surface Grinder is a self-contained unit with a 2-speed ball-bearing spindle, driven by a 3/4 HP motor. Completely equipped with dust guards.

COMPLETE
WITH MOTOR

\$485⁰⁰

F. O. B.
Providence, R. I.

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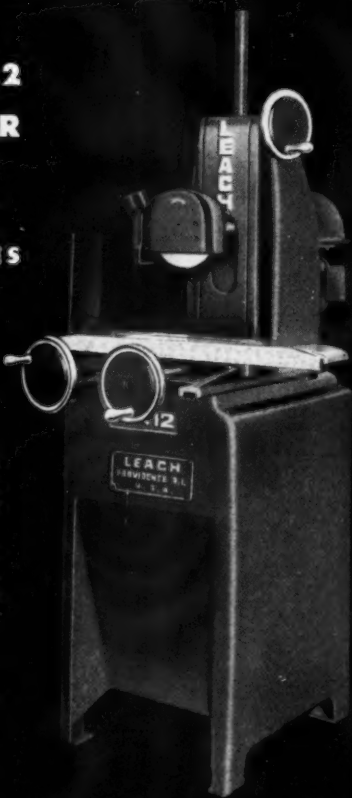
H. LEACH MACHINERY CO.

387 CHARLES STREET

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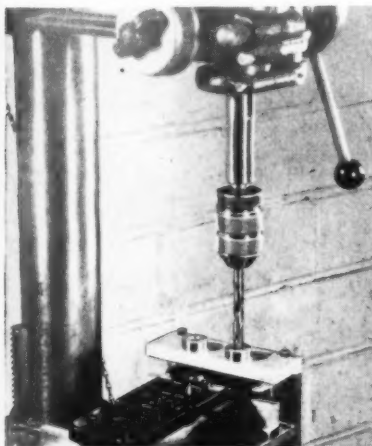
PROVIDENCE 4, R. I., U. S. A.

DEALERS IN PRINCIPAL CITIES



NEW SEVERANCE DUAL-FUNCTION TOOL

Drilling and Reaming in one continuous stroke is now possible with the new Severance High Speed Drill-Reamers. They are offered in five sizes: 3/16", 1/4", 3/8", 1/2" and 9/16" diameters. The drill section of these tools provides for drilling through materials of any thickness equaling their diameter. Sufficient allowance has also been made



for grinding the drill point several times. The reamer section is designed with teeth of high shearing qualities arranged to preclude chatter and expel chips into the main flutes of the tool. Due to this shearing action, superior finish and consistency of size are claimed.

The Drill-Reamers are best suited for short, through holes, where it is possible to complete the drilling function before the reamer section begins to finish. Drill-Reamers having longer-than-standard pilot drills are furnished to order; solid carbide drills can also be furnished.

In radial drill press operations, second positioning is no longer required for reaming; if jigs are being used, only reamer bushings are needed, which ob-

viates a complement of drill bushings and the lost time for the change. Write for catalog No. 16 for complete details:

**Severance Tool Industries Inc.,
722 Iowa St., Dept. BB
Saginaw, Michigan.**

COMBINATION FLEXIBLE TAPE AND FLASHLIGHT

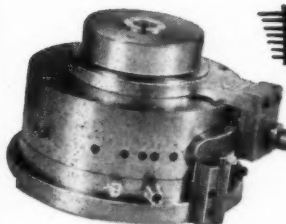
A combination of a 6-foot flexible tape and a flashlight has recently been developed. It is no larger than a cigarette package; it weighs only 5 oz., and fits easily into the hand or pocket. This handy tool, called the E.Z.C. Rule, is constructed of an aluminum case, containing a 6-foot snap-back rule, with etched figures on polished high carbon steel. It holds a replaceable battery and magnifying spotlight type lamp.



The manufacturers suggest that the E.Z.C. Rule makes an excellent item for extending good-will and advertising contacts; the rule, with a firm's printed seal affixed to it makes an excellent advertising medium. For further details, write:

**Cowher Industries, Dept. BB
899 Boylston St.
Boston 10, Mass.**

"Air Devices by Redmer"



RC-5



Index Chuck

with Air Operated Collet

Eliminates removing chuck from base of machine for changing index position. Index screw posts located on OUTSIDE of chuck. Provides positive alignment and depth control by using stationary type collets. Capacity 1/16" to 2".



Air Foot Control and Valve

Designed to make its operation as tireless as possible. Opening and closing of plunger of valve on foot pedal is operated by a roller on pedal casting which relieves wear on plunger and facilitates operation. Valve is a brass casting which will take plenty of abuse and can be removed from the foot control and used as a separate unit in connection with cam operations.



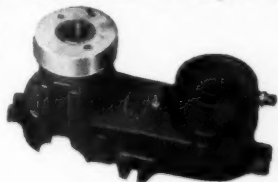
No. FC-28

V-29



Collet Air Chuck

An air operated collet holding fixture using same type collets as Brown & Sharpe automatic screw machines. For drilling, milling, threading, etc., also for assembly work. Six models, No. 00, No. 10, No. 0, No. 2, No. 2 Special, No. 4, Collet Capacity 1/16" to 3 1/4".



Write for literature and prices

REDMER AIR DEVICE CORP.

9136 West Belmont Avenue

Franklin Park, Illinois

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

211

NEW SUSPENDED FORK TRUCK FACILITATES MATERIALS HANDLING

A new suspended fork model Trans-stacker, weighing 17% less, and incorporating ten major improvements in its design, is announced by Automatic Transportation Co. Weighing 3400 lbs., the suspended fork model is the most popular of the four types in the Trans-stacker line.



An automatic tilt at any carrying position is standard equipment. Automatically cradling all loads, the tilt is one which the operator cannot forget to use. It operates through a vertical cam, 9" in height, bolted to the lower front of the truck's mast. As the fork carriage is raised, the cam pushes the lower carriage roller forward, tilting the entire carriage and raising the front end of the forks proportionately. Maximum tilt is maintained over three inches of the cam where it is the thickest, and in standard position this tilt begins when the heel of the forks is 6" from the floor. The height of tilt may be varied from 3" to 12" above the floor by adjusting the position of the cam. This will provide for the handling of anything from tinplate pallets to 12-inch skid platforms.

Other improvements are designed for more effective operation, durability, safety, and economy. Completely electric powered the Transstacker combines light

weight with the dependability, freedom from fire hazard, and fume-free operation of electric propelled trucks.

Capacity of the suspended fork Trans-stacker is 2500 lbs. for a 36" load, or 2,000 lbs. for a 48" load. Lifting height of the forks is, 64"; overall height is 79", allowing ample clearance for 7-foot factory and freight car doors. For complete specifications, write:

Automatic Transportation Co.,
Dept. BB, 149 W. 87th St.
Chicago 20, Ill.

"UTILITY" MARKING HOLDER AVAILABLE IN NEW SIZES

"Utility" Marking Holder, for marking etched plates, tags, stock checks; brand names or stock number on steel bars; special coding, serial numbering, etc., is now available in a wide range of slot sizes, according to M.E. Cunningham Co.

The new range of "Utility" Holder sizes, includes $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ ", etc., up to 2" slots, making possible the stamping of long part or stock numbers, down to short serial numbers in the smallest type sizes. Nine sizes of type



characters, from $\frac{1}{32}$ " through $\frac{1}{4}$ " sizes, may be used in the same "Utility" holder.

For further information, write to:
M. E. Cunningham Co., Dept BB
228 E. Carson St.
Pittsburgh, Pa.



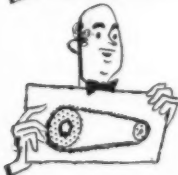
Foreman: "Ferdinand's tickled pink since we switched from the old set-up wheels to these Armour Abrasive Belts!"

3 REASONS WHY ARMOUR BACKSTAND BELTS ARE BETTER!



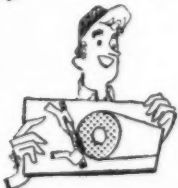
1. Sharper Coating!

Ferdinand: "Take it from me—I've worked with both the old set-up wheels and these Armour Coated Abrasive backstand belts. And since we converted our bench grinders into belt grinders by using backstand units—we've had sharper, tougher, smoother cutting action. That's because factory-coated belts have uniform grain distribution. It was the inaccurate, uneven coating of the set-up wheel which slowed down cutting action."



2. Cooler Cutting!!

Foreman: "Right, Ferdy! We know, too, that belts afford greatly increased production because their cutting surface is greater. The point of contact on the belt gets a chance to cool as it passes around the idler. Results—cooler cutting, longer abrasive life, less tendency to burn work."



3. Greater Contact Area!!!

Ferdinand: "And with the resilient contact wheel you get a cushioned grind and greatly increased contact area. This cushioned grind gives us smoother, cleaner finishes—in less time, at lower costs—even on the surfaces that are hardest to reach. To us operators that means less fatigue—and my friend, the Foreman, knows that it also means more speed and greater production."

For abrasive advice—consult your Local Armour Industrial Distributor

ARMOUR and Company



Coated Abrasives Division

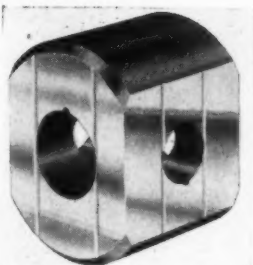
1355 WEST 31st STREET • CHICAGO 9, ILLINOIS

FRICION GREATLY REDUCED IN POWER DRIVES

By a simple, efficient change in the center block of universal joints, Curtis Universal Joint Co., Inc. has reduced frictional heat in power drives to a minimum.

Two shallow grooves on each of the four bearing surfaces of the center block break each surface into four smaller areas, making 16 small bearing surfaces of the center block instead of four larger surfaces. These grooves reduce the size of the areas subjected to friction, cause a more even distribution of wear, conduct oil more effectively to lubricate wearing surfaces, and allow the kinetic energy, or frictional heat to be dissipated more uniformly and rapidly.

The manufacture claims that this new center block permits universal joints to run much cooler and be unaffected in overload tests, at excessive torque and angles, that cause failure and "freezing"

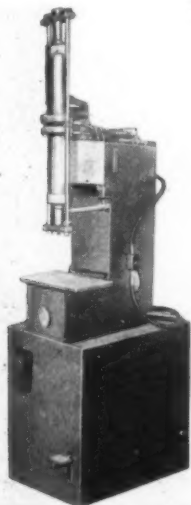


of ordinary joints through frictional heat. Grooves do not reduce the breaking load in torque or tension. For additional information, write:

**Curtis Universal Joint Co., Dept. BB
Springfield, Mass.**

MUNTON TWO-WAY 5-TON HYDRAULIC PRESS

This new type two-way (pressure up and pressure down) hydraulic press is designed to meet standard requirements for forming, punching, drawing, broaching, marking, assembling, and similar jobs.



The press ram descends at high speed under full pressure and returns at a higher speed with less pressure. The maximum down stroke is 460" per minute, and the maximum upstroke is 800" per minute, on the five ton model. Similar speeds can be attained with the 10, 20 and 30 ton models with the use of an extra-low pressure pump.

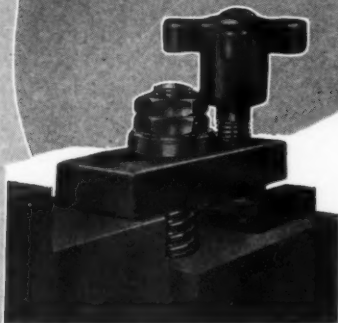
The stroke is 6" on the standard model and is adjustable to 1" at any position within the stroke. If a die set or die only requires a 1" stroke to operate, when this is set in the press at low position, it is 5" from the ram plug. The ram plug is brought down to the die set with power, and the adjustable collar is set so that the piston only raises one inch. Longer stroke can be furnished at extra cost.

The cylinder is steel with a welded dome. Cylinder cap and packing nut as well as all fittings, press, and oil reservoir are steel. No inside cups are used on this press, eliminating the necessity of dismantling in order to replace rings and cups. All parts are easily accessible for replacement. For complete details on this unit, write:

**Munton Manufacturing Co., Dept. BB
Franklin Park, Ill.**

SIEWEK

FIXTURE CLAMPS
AND FITTINGS



**JACK LOCKS, FIXTURE LOCKS,
CAMS, KNOBS, REST BUTTONS**

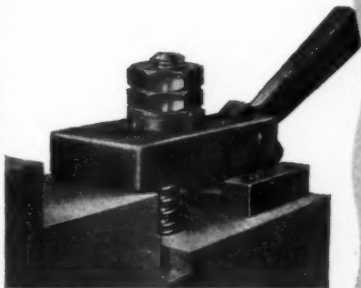
Clamp assemblies and other parts necessary for the construction of special fixtures make up this standard Siewek line.

These Clamp assemblies themselves are made in 36 different types, most of them in three sizes. In other words, there is a type and size to meet the requirements of practically all shops.

Write for full size template drawings for use in layout work.

**ALSO MANUFACTURERS OF SIEWEK
RAPID CLAMPING JIGS AND DETAILS**

IMMEDIATE DELIVERY
from stock of all Siewek Jigs, Clamps and Fittings is now possible from these strategically located firms:
Paul D. Slater Co., 1625 Santa Fe Ave.,
Los Angeles, Calif.
H. Colby Rowell Co., 2447 Nicollet Ave.,
Minneapolis 4, Minn.
Fink Tool Co., 898 Clinton Ave., S.,
Rochester 7, New York
H. E. Scholey, 2803 N. Main St.,
Dayton, Ohio



Siewek **TOOL COMPANY**

3282 E. GRAND BOULEVARD
BRANCH OFFICE: CHICAGO — SIEWEK TOOL CO.
224 S. MICHIGAN AVE. WABASH 3509 CHICAGO 4, ILL.

HYDRAULIC BROACHING MACHINE HAS 30-TON CAPACITY

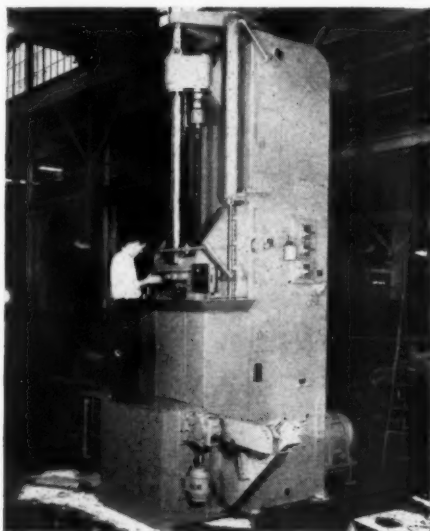
The American Broach & Machine Co., announces the completion of a large type vertical pull-up internal hydraulic broaching machine. This machine with an overall height of 16' 10" and a gross weight of over 17 tons, has a normal operating capacity of 30 tons and a broaching stroke of 60".

The Company designed the machine to broach involute splines in gear blanks for a large producer of these parts.

One feature is the helix lead and nut bar for driving the broaches during the pulling stroke. Another is the lower guide, which not only raises the broaches up to the pull heads but also continues to go up, providing the large broaches with additional alignment during the broaching stroke.

One complete cycle produces two parts which are first loaded into a slide while the broaches rest in the lower guide. The slide is pushed into position and the buttons depressed to start the machine cycle. Broaches are raised by the lower guide until the shank ends come up through the parts and are connected in the automatic broach pull heads.

The main machine ram then starts the broaching stroke and lower guide



continues up providing alignment for the principle portion of the cutting action. When broaches reach top portion of cycle, operator unloads parts (see picture) and then starts the main slide down returning broaches to the lower guide.

Machine is equipped with a chip conveyor for removing excess chips, which accumulate in the coolant reservoir.

"STAR DUST" LABORATORY GRADED PURE DIAMOND POWDERS

For GAUGES, TOOLS, DIES, etc., with tremendous TIME SAVING. These factors make STAR DUST indispensable in lapping and superfinishing on HARDSTEELS, TUNGSTEN CARBIDE, CHROME.

- Absolute control of particle sizes
- Complete absence of out-size particles
- STAR DUST sizes as fine as .0001"
- Complete range of grit sizes

There is a STAR DUST Field Serviceman in your territory.

ACE ABRASIVE LABORATORIES

ONE SPRUCE STREET
NEW YORK 7, N. Y.

STAR DUST speeds up production enormously and produces finishes and superfinishes down to less than .0000004 of an inch.

**Precision LAPPING
POWDERS for
PRECISION work**

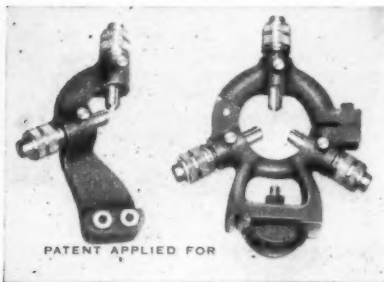


A machine of this type is normally installed in a pit with the operator's platform at floor level. For complete specifications, write:

The American Broach & Machine Co.
Dept. BB
Ann Arbor, Mich.

DE LUXE WORK SUPPORTS

To provide quicker and more efficient operation on certain classes of lathe work, a De Luxe type Follower Rest and Center Rest have been developed by the South Bend Lathe Works. The principal features of both units entail wrenchless adjustment and locking of the jaws. Each jaw has a large knurled knob for adjusting the jaw position, and a thumb screw for locking. A double acting compound screw thread provides approximately 3/16" jaw movement for each revolution of the adjusting knob. Smooth action, with just sufficient resistance to hold the jaw securely in position until it is locked with the thumb screw, permits quick adjustment with exact precision.



The jaws are brass and slide through precision steel sleeves which are pressed into the supporting frame. Manufactured to close tolerances throughout, the jaws and other parts are easily replaceable. Both units are available for current models of South Bend Lathes. For further information, write:

South Bend Lathe Works, Dept. BB
384 E. Madison St.
South Bend 22, Ind.

famco machines

**COST
CUTTING**

ARBOR PRESSES

Famco arbor presses are available in 32 stock models for floor or bench mounting . . . feature exclusive adjustable gib for front and side ram adjustment. Average less than 2c a year per press for maintenance cost!



FOOT PRESSES

Savings multiply on light punching and forming jobs with the use of any one of the 10 Famco foot press models. They may be bench or floor mounted.



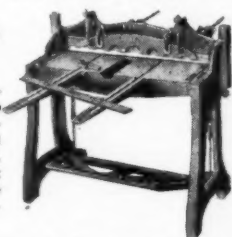
PUNCH PRESSES

Newest of the Famco family, these power operated, open-back, inclinable punch presses are available in bench or floor models. Have semi-steel cast iron frames; solid, forged, precision-ground crank-shafts. With or without motor.



SQUARING SHEARS

Famco foot-operated shears do precision shearing of up to 18 gauge mild steel. Come in 5 cutting widths (22" to 52") . . . have easy-to-set gauges.



Famco Machines save in first cost, operating cost and maintenance cost. Write today for full details about the complete line . . . there is no obligation.

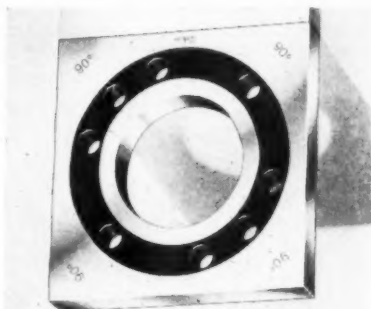
FAMCO MACHINE CO.

1320 RACINE STREET • RACINE, WISCONSIN

TRUE SQUARE PROVIDES EXTREME ACCURACY IN INDEXING

A precisely indexed fixture has always provided more than its share of headaches to tool engineers. The margin of tolerances for indexing in tenths offers a painstaking and sometimes extremely difficult job.

Due to recent improvements in angle measurement such as provided by Webber Gage Company's angle blocks, a new approach is developing based on the possibilities of the Webber True



True Square is the basic gage for fast precision indexing. When combined with Webber Angle Blocks, almost any combination of indexing angles can be inspected with speed and accuracy.

• • •

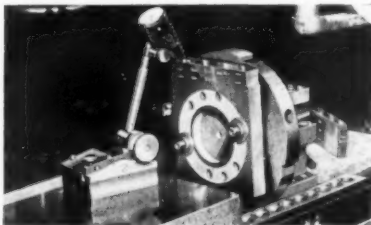
Square. All faces of this square are at precisely 90° to adjacent sides, with perfect optical flatness and parallelism.

Its application lies in the simple method it provides for the indexing of angular grinding fixtures similar to the illustration below. Here the Square is mounted on a revolving fixture for grinding notches at precisely 90° intervals.

The notch itself is a 92° angle ob-

• • •

True Square with +3°, -1° Webber Angle Blocks mounted to check the accuracy of the indexing fixture.





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- FULLY AUTOMATIC
- END BEARING FAILURES
- SAVE OIL-TIME-WORRY
- MODERNIZE EQUIPMENT

Many styles & sizes
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TRICO FUSE MFG. CO.
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The COLOR tells the THICKNESS

ARTUS Arbor Spacers made of plastic in various colors identify thickness at a glance! .001, .0015, .002, .003, .005, .0075, .010-.030. Speed up accurate fitting at low cost. Write for folder.

CONVENIENT TRIAL OFFER
Handy Spacer Assortment

10 ea.	.001 — .0125 thick
5 ea.	.015 — .030 thick

100 SPACERS IN ALL

7/8" — \$3.10	1 1/4" — \$3.80
1" — 3.35	1 1/2" — 4.70

Other standard sizes also available.
*Illustrated Folder Free.
 Immediate Delivery on
 Spacers, Gaskets, Shims*

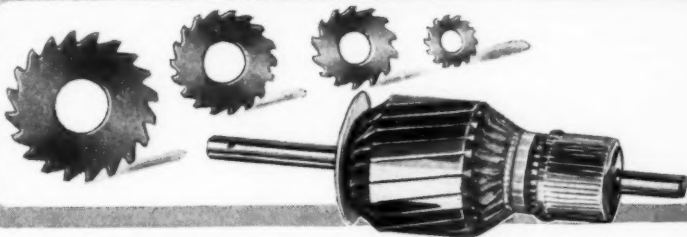
INDUSTRIAL PRODUCTS SUPPLIERS
 434 Broadway New York 13, N. Y.

CIRCLE [®]

Solid Tungsten Carbide

COMMUTATOR SLOTING SAWS

"U" Type



INCREASE PRODUCTION
25 to 80 TIMES over High Speed Steel Saws

Commutator slotting saws are made in diameters from $\frac{3}{16}$ " to 1 $\frac{1}{2}$ ", and from .010" to .045" thick. They operate at 5,000 to 6,000 R.P.M. and assure better work at these greater speeds! Complete price information available on request.

CIRCULAR TOOL CO., INC.

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STANDARD CARBIDE BLADES...

For All Types of
Milling Cutter Bodies

Check These Advantages:

Lower Cost
Stock Delivery
Guaranteed
Workmanship



Oversize Tip-Diamond Lapped Flush
With Top of Shank
10° Relief Angles
Preformed On Tip and Shank
Blade Number and Grade Visible
After Blade Is Assembled in Body

We Fabricate All Types of Carbide Tools. Write for Bulletin No. 101.
or Send Print or Sample for Quotation.

WISCONSIN CARBIDE TOOL CO., 2439 W. Fond du Lac Ave., Milwaukee 6, Wis.

tained by two successive cuts, one at 90° with True Square, and the other at 2° with the addition of two angle blocks (+3°, -1°) mounted on square. The chuck is adjusted before each grind and cut taken after a zero reading is noted. The process is repeated by turning the assembly to successive zero readings. The advantage lies in the precision and time saving involved; instead of eight settings, each notch is ground with the single setting plus a small adjustment for the 2° cut.

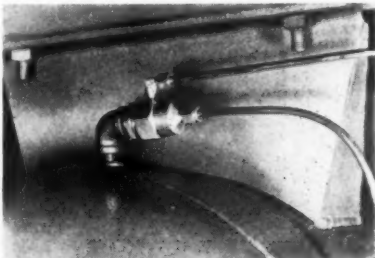
A variety of applications can be obtained by this method, opening the process to fast precision indexing that are only limited by the ingenuity of the tool maker. For complete details and specifications, write:

Webber Gage Co., Dept. BB
12900 Triskett Road
Cleveland, Ohio.

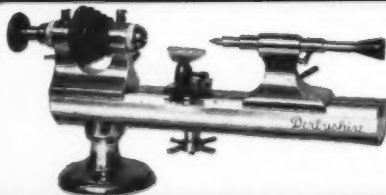
LIQUID REMOVAL DEVICE ELIMINATES MANUAL DRAINING

An easily installed, fully automatic water unloader which removes all wa-

ter and oil from air compressor tanks is announced. The unit is designed to fit any electrically operated air compressor equipped with a centrifugal or



magnetic unloader. It is called the Lansdale Water Unloader. It eliminates manual draining of a tank by automatically drawing off the harmful water and oil as it collects, thus avoiding the possibility of liquid being forced into the air lines, causing corrosion or



The WEBSTER-WHITCOMB

World famous for its
accuracy, dependability
and fine workmanship.

Chuck capacity .1969"
12" Bed, Swing 3.94"

Lathe Makers
Since 1874

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STRONG

WHERE STRENGTH
BOOSTS PRODUCTION

ABRASIVE M-34 Vertical Spindle Grinder



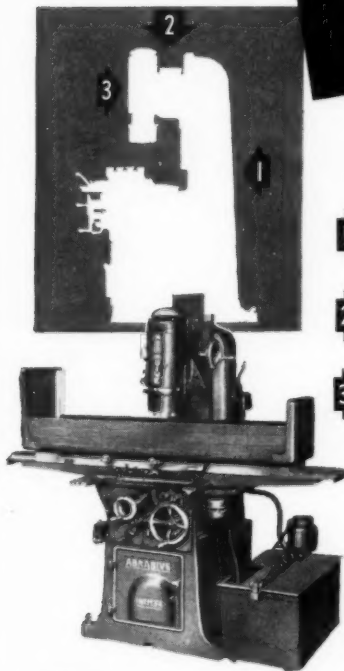
STRONG one-piece bed and pedestal casting (1540 lbs.) ribbed for ruggedness—prevents distortion, minimizes vibration.



STRONG spindle mounting — very short overhang — is gibbed to column along full length of the vertical ways.



STRONG motorized spindle — a self-contained cartridge-type unit, with SKF support for spindle and wheel, gives true, smooth grinding.



SPECIFICATIONS

Work Capacity: 24" long, 8" wide, 12" high.
Spindle: Built-in 5 H.P. motor, 3450 r.p.m., Pope SKF ball and roller bearing. Wheel size: Segment Type, 6" diameter. Table Size Overall: 39" x 16½". Net Weight: 3000 lbs.

ABRASIVE

ACCURACY BOOSTS PRODUCTION

The Abrasive M-34 Vertical Spindle Grinder is built for long, productive service. It has strength for hogging off metal on deep cuts — strength for holding close tolerances and producing fine finishes. The grinding wheel is driven directly by the full power of the 5 HP motor. It's easy to operate, too: spindle downfeed is automatic... longitudinal table travel is automatic and hydraulically cushioned for shock-free, smooth running. For accurate grinding of flat work such as spacers, washers, parallels, etc., the Abrasive M-34 is a fast producer in tool room, machine shop or production line.

Write for Bulletin

ABRASIVE MACHINE TOOL CO.
EAST PROVIDENCE 14, RHODE ISLAND

Buy KIPP AIR GRINDERS Because

The RPM's stay up while grinding... not only when the grinder runs idle.

It is an established fact that surface speeds must stay up to approximately a mile a minute if you want to grind — not just rub. The speed of Kipp air grinders drops but slightly when put to work. That means better work—longer wheel life.

Buy Kipp air tools for best results, lower prices.

MODEL JA
50,000 R. P. M.

\$42⁰⁰

IN U. S. A.



Weight 12 ounces;
length 6¾ inches;
chuck size ⅜ inch.
Wheel guard re-
moved for better
illustration.

MADISON-KIPP CORP.

207 Waubesa St., Madison, Wis., U. S. A.

- Skilled in DIE CASTING Mechanics
- Experienced in LUBRICATION Engineering
- Originators of Really High Speed AIR TOOLS

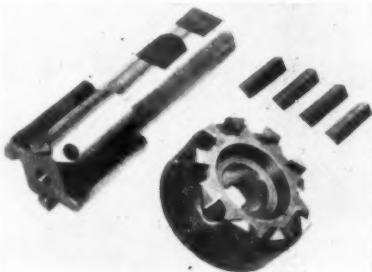
clogging of tools or spray mixture.

As a means of filtering out particles of rust and dirt and preventing possible damage to the unloading mechanism, the unloader has a wire mesh screen inserted ahead of the mechanism.

A. Shelburne Co., Dept. BB
739 Ceres Ave.
Los Angeles 21, Calif.

¾" SOLID CARBIDE TRI-BITS

Weddell Tools, Inc. have introduced a light duty cutter blade to their line of triangular shaped cutter blades known as the 3/8" Tri-Bit. This is furnished in solid carbide. Illustrated is its application to small shell type face mills or solid shank end mills. The triangular tool bit is positively locked home into a vee in the triangular shaped hole by a simple lock screw. No



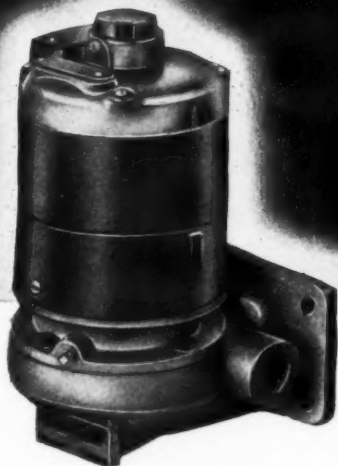
wedges are required. It is adjustable by individual adjusting screws behind each Tri-Bit, giving positive adjustment, affording minimum blade movement for resharping, and conserving carbide blade material.

The triangular cutter blade permits close blade spacing with maximum chip clearance. It is claimed that this is the smallest inserted blade cutter with the largest number of blades. The minimum size shell end mill as shown, is 12" diameter, ¾" bore, with 10 adjustable carbide blades. Solid shank end mills are furnished 1" diameter and up. For details, write:

Weddell Tools, Inc., Dept. BB
11 Centennial St.
Rochester 11, N. Y.

MORE RELIABLE PUMPING

of
COOLANT
and
CUTTING OIL



with

I-R COOLANT PUMPS

If you're looking for long, dependable pumping service; want to reduce machine tool maintenance—use the Ingersoll-Rand line of circulating and coolant pumps. They are compactly designed, and ruggedly built with a minimum of moving parts for quiet, efficient, and smooth operation. Ask Ingersoll-Rand for complete information covering performance, application and selection data on immersion, sidewall, and foot-type pumps.

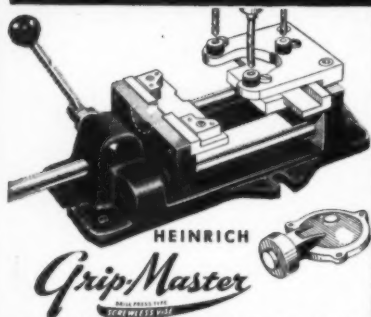


Ingersoll-Rand

11 Broadway, New York 4, N. Y.

264-9

2 TIME SAVERS

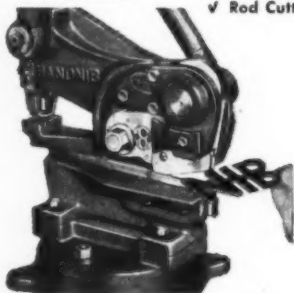


The World's Fastest Drill Press Vise May Also Be Used as a Base Structure for Jigs & Fixtures.

This unique *screwless* vise provides instantaneous, effortless setting. Patented gripping mechanism guarantees positive locking. Wide clearance between guide bars permits clear-through drilling. Built-in parallels save leveling time. Write for folder.

USE HEINRICH HANDNIB No. 5 for

- ✓ Outside Nibbling
- ✓ Inside Nibbling
- ✓ Shearing
- ✓ Punching
- ✓ Rod Cutting



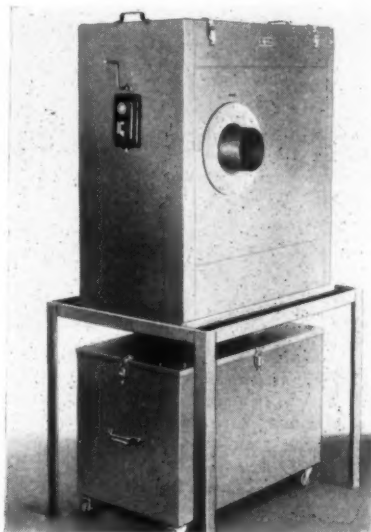
A five-in-one "handyman" which nibbles (outside and inside), shears, punches and cuts rods. Eliminates hours of tedious hand-work. Quickly, easily cuts templates and trial blanks in any desired shape. Takes up to $\frac{1}{2}$ " flat stock. Also $\frac{3}{4}$ " round stock. Write today for illustrated folder.

NATIONAL MACHINE TOOL COMPANY
DEPT. 108-F • RACINE, WISCONSIN

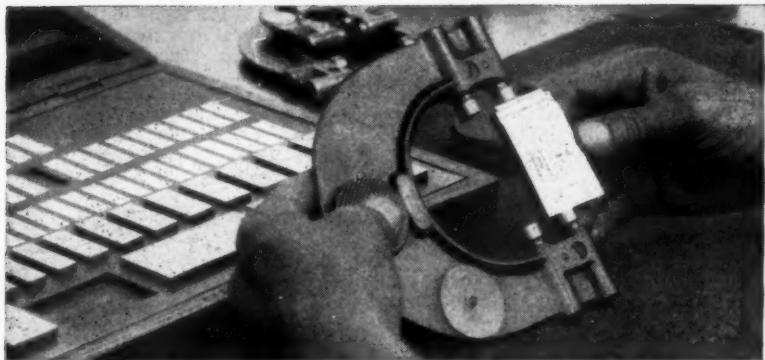
DUST COLLECTOR HAS OWN STORAGE BIN

A new self-contained, unit type Dustkop dust collector, equipped with a large volume dust storage capacity for dust collecting operations where large quantities of dust, lint, chips, etc., are involved, is introduced by Agest-Detroit Co.

The new unit, Model 11B50, employs a roll-a-way bin with a clamp down cover to collect and store the dust, yet permits its easy removal to the point of disposal. Useful where extremely fine dusts are involved, the sealed bin permits the removal of the collected dusts without the possibility of dust escaping from the container.



Actual suction capacity of the Model 11B50 Dustkop on a 6" inlet is 1394 c.f.m. at 3.2 static suction. This is developed by a $1\frac{1}{2}$ h.p., 3450 r.p.m. continuous duty motor, driving a paddle-wheel type fan. A cyclone separator is contained within the unit where the dust laden air receives its first cleaning. A second stage filter of spun glass forms



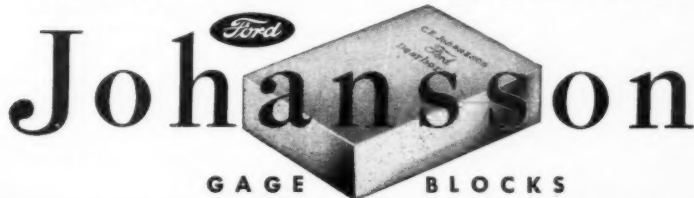
Tolerances Worth Maintaining Are Worth Jo-Block Protection

When you set up dimensional inspection tolerances, it's to insure a specified class of fit in assembly, or to make sure of parts-interchangeability, or for some other good reason. The harder it is for an inspector to be *sure* he's staying within limits, *the more it costs*.

So, why not put a set of Ford Jo-Blocks on guard? Make it part of somebody's routine to check every working gage—whether snap-gage, micrometer caliper, dial indicator, plug-gage, ring-gage, or any other dimensional test device—with genuine Ford Jo-Blocks at definite, frequent intervals. Then, you'll *know* that everybody concerned is "speaking the same language" of measurement. Chances are that inspection will speed up and rejections at final inspection will be fewer.

Jo-Blocks are not expensive. They're made to three warranted accuracy standards—plus or minus .000002", .000004" and .000008". Sold throughout the Americas as single blocks or in varied sets (metric measurement, too). Extremely useful accessories available to expand and facilitate the use of Jo-Blocks. Write for illustrated literature. *Address:*

FORD MOTOR COMPANY • JOHANSSON DIVISION
3606 SCHAEFER RD. DEARBORN, MICH.



the top of the unit and this furnishes a second stage cleaning of the air before it is returned to the working space. Shake down of the filter is accomplished by means of a hand crank.

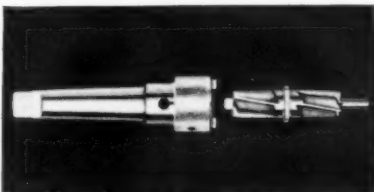
Total space required for the unit is 24" x 40"; overall height is 72". The dust bin measures 20" x 36" x 21". For complete data, write:

Aget-Detroit Co., Dept. BB
Main at Washington St.
Ann Arbor, Mich.

DOUBLE END COUNTERBORE AVAILABLE IN STEEL OR WITH CARBIDE INSERTS

The Plan-Co Double End Counterbore, with cutting edges at two ends is announced by the Plan-O-Mill Corporation. The new tool is available in a complete range of sizes in high speed steel or with tungsten carbide inserts. Both single and multi-diameter styles are offered, with or without pilots. Two types of holders — collet and sleeve—provide fast tool replacement and furnish a positive drive with a runout of less than .002".

The device has twice the life of single end tools at only slightly more than single end tool cost; longer operation without time out for sharpening, since when one end is dulled the cutter is reversed and the other end is used; less need for high tool inventories, since one Plan-Co Counterbore does the work of two ordinary tools.



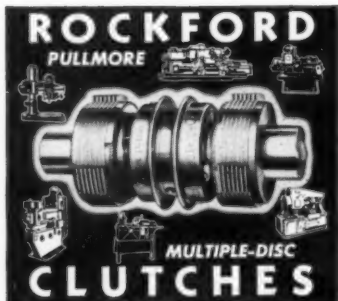
Complete details on Plan-Co Double End Counterbores and Holders, may be obtained from:

Plan-O-Mill Corp., Dept. BB
1511 East Eight Mile Road
Hazel Park 20, Mich.

For PRECISION Built

Specify

- COMPACT DESIGN
- HIGH TORQUE
- HIGH-RATIO LEVERS
- POSITIVE NEUTRAL
- PRECISION BUILT
- LONG WEAR LIFE
- EASY ADJUSTMENT



Precision machining and grinding, proper hardening and the symmetrical contours of PULLMORE Multiple Disc CLUTCHES insure perfect balance and smooth operation at both high and low speeds. Because of this close-tolerance construction and compact design the powerful pull of PULLMORE CLUTCHES is not affected either by centrifugal force or the direction of rotation.

Send for This Handy Bulletin

Shows typical installations of ROCKFORD CLUTCHES and POWER TAKE-OFFS. Contains diagrams of unique applications. Furnishes capacity tables, dimensions and complete specifications.

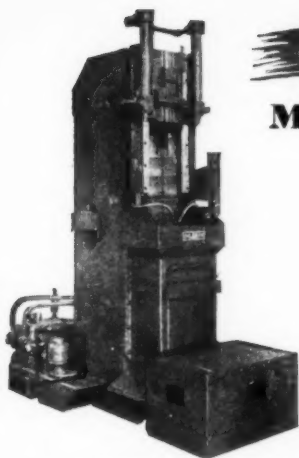


ROCKFORD CLUTCH DIVISION

BORG-WARNER

▲ 1309 Eighteenth Ave., Rockford, Illinois, U. S. A. ▲

Pullmore Clutches are sold by Motor Chain Co., offices in principal cities.



MEMO

*to users of
metal working
equipment...*

The new features recently installed on all Ruthman Gusher Coolant Pumps increase efficiency, prolong life expectancy, and reduce maintenance cost.

RUTHMAN GUSHER COOLANT PUMPS

Illustrated is an Oil-gear Type XP Vertical Broaching Machine equipped with a 1/2 HP Model TL-7320 Gusher Coolant Pump.
Photo Courtesy Oil-gear Co.

New type end-bell on totally enclosed motor has built-in conduit box with ample capacity to accommodate the multiple lead wires or dual voltage stators. Concealed through-bolts fastened from inside of upper end-bell give drip-proof construction and improved appearance. Oversized pre-lubricated ball bearings eliminate oilers or grease fittings.

Write now for Catalog 10-G

THE RUTHMAN MACHINERY CO.

1816 Reading Road

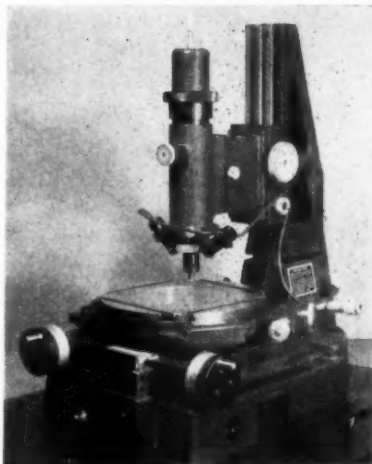
Cincinnati 2, Ohio



SPOTTING ATTACHMENT MOUNTED ON TOOLMAKER MICROSCOPE

The M2001SA2 Spotting Attachment, which is useful in laying out drill jigs, templates, etc., mounts on the support arm of the Toolmaker Microscope in place of the standard optical system. It consists of a microscope of 25x magnification especially designed for this application and with facilities for mounting and spinning a spotting tool. The spotting tool is located on the optical axis, thus permitting the object on the stage to be marked at the exact point viewed by the observer. There is no horizontal displacement of microscope or stage between operations of viewing and spotting.

The operator first adjusts the stage until the object is properly positioned as viewed through the microscope. If the point indicated by the reticle is to be spotted, the spotting tool is placed in position at the objective and the spinning cap is slipped over the eyepiece. By a control knob, the tool is lowered with one hand into contact



with the work and is then spun with the other hand. The weight of the spindle on the tool supplies the normal tool pressure. Two weights are supplied to augment the weight of the spindle when required for deep spotting in hard materials. The tool automatically withdraws from the work when the control handle is released.

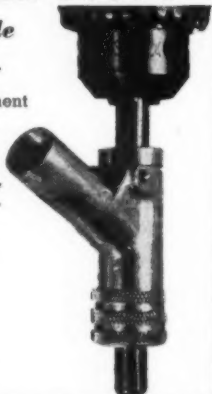
The attachment has been designed with care to insure retention of its original accuracy throughout long and intensive service. The spotting tool holder has suitable means for exact centering of the tool and the user can quickly adjust and check this centering. The tool holder fits to the microscope on bearing surfaces which are held to close tolerances.

**The Gaertner Scientific Corp.,
Dept. BB 1201 Wrightwood Ave.
Chicago 14, Ill.**

LOW COST LOCATING BY CENTER SCOPE

*Dependable
Accuracy.*

Ample Adjustment
For Spindle
Run-Out.
For
Drill Presses,
Lathes, Mills.



SERIES "M"

\$24.50

CASE EXTRA

\$3.50

Bulletin M-3

CENTER SCOPE PRODUCTS

3829 San Fernando Rd., Glendale 4, Calif.

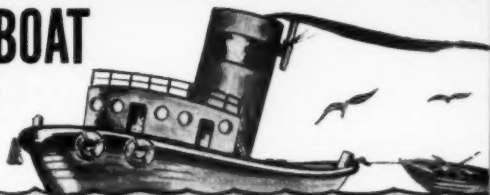
CERTIFIED AIR RECEIVER

A new line of air receivers is now being manufactured in sizes from 9 through 170 gallons capacity by the Dayton Rogers Manufacturing Co. These receivers are furnished with a certified code tag, and are manufactured and in-

WHY USE A TUGBOAT

TO PULL A ROW BOAT

... and



WHY BUY A BIG COSTLY SHAPER... *when*

THE
AMMCO
WILL GIVE YOU
TOP PERFORMANCE ★
UP TO 7"?



★ NO BIG SHAPER CAN BEAT THE AMMCO FOR
★ ACCURACY ★ VERSATILITY ★ SPEED ★ ECONOMY

Here is America's No. 1 Precision Shaper for all work up to 7". It is accurate—vibrationless, and on many jobs requires as little as two to three minutes set-up time. It handles a wide variety of work and cuts cost, saves time and labor.

The Ammco is a rugged machine—built for continuous operation—shaping jobs can be handled at lower cost and faster with the AMMCO—and it will take care of 75% of shaping requirements in most plants. It has the features of larger, more expensive machines plus economy of operation—you can't afford to be without one or more.

Write for full information and a copy of our new shaper catalog No. MTB-648.

*You can do it
Better and Faster
with*



*Skill is Built
into Every
Ammco Product*

AMMCO TOOLS, INC. • COMMONWEALTH AVE. • NORTH CHICAGO, IL

spected according to the A.S.M.E. Code. They will handle all gases and liquids under pressures up to and including 200 lbs. per square inch.

All air receivers are thoroughly inspected, which includes hammer test under hydrostatic pressures, together with air pressure twice the rated capacity, including final air test. They are ready for immediate delivery. For further data, write:

Dayton Rogers Mfg. Co., Dept. BB
2849 12th Ave., So.
Minneapolis 7, Minn.

RIGID HACKSAW FRAME SAVES LABOR AND MATERIAL

The important feature of the Rigid Hacksaw Frame is its strong construction, obtained by the one-piece steel tube back fitted into the cast-aluminum handle. This permits tightening the blade to high tension, which maintains true alignment without twisting the blade, a contributing cause of blade wear and breakage.

Alignment is further assured by blade holders, whose squares are received by accurately milled slots, permitting neither side nor vertical deflection. The handle is designed so that the thrust is directed behind the blade, not above it.

ceived by accurately milled slots, permitting neither side nor vertical deflection. The handle is designed so that the thrust is directed behind the blade, not above it.



The Rigid Hacksaw Frame does not collapse while blade is being installed. It is adjustable for 10" and 12" blades. All steel parts are cadmium plated; total weight is 1 lb. 6 oz. For further details write:

Machine Rebuilding Co., Dept. M-1221
2738 Chene St.
Detroit 7, Mich.

ANTON PARALLELS

INCREASE PRODUCTION

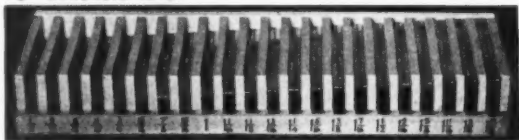
ANTON PARALLELS FILL A LONG-FELT NEED — permanently straight and accurate, yet priced for every-day general machine shop use.

ALL PARALLELS FULLY GUARANTEED — To be within the Limits Specified.

MAXIMUM SIZE TOLERANCE .001 INCH ON GROUND SIDES — Maximum Variation in Parallelism and Straightness within Length .0001.

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ANTON PARALLELS COME IN 70 STANDARD SIZES

- 1/4" Thick x 6" Long — 1/2" to 1 1/2" High in Steps of 1/8".....\$96.00 per set — 22 pairs.
- 1/2" Thick x 6" Long — 1 1/4" to 1 1/2" High in Steps of 1/8".....\$71.00 per set — 11 pairs.
- 3/4" Thick x 6" Long — 1 1/2" to 1 1/2" High in Steps of 1/8".....\$88.75 per set — 11 pairs.

* Price per set includes a large Wooden Container

Large Stock of Single Pairs also Available

All Prices are F.O.B. New York

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National Representatives
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Representatives for
Illinois, Iowa, Wisconsin
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*Increase Your Output
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*use the efficient
SHAPE-RITE SHAPER*



The 8" Hy-Duty Model Shaper, taking a full 8" cut, is unexcelled for tool and die makers and small instrument manufacturers.

SHAPE-RITE Shapers are engineered to provide faster set-ups . . . one of the most important elements for greater production.

Maximum versatility, controls within easy reach, and many other built-in features cut set-up time to a minimum and eliminate many costly jigs.

• In addition, there are other features such as speed and ease of operation . . . built-in accuracy . . . flexibility . . . dependability . . . and durability. The SHAPE-RITE SHAPER furnished with plain or swivel table will take day-in and day-out capacity production and will increase output of precision work. A truly outstanding shaper for fast economical operation that you ought to investigate now!

See Your Local Dealer or Write Dept. B-68 for prices.

Sales Service Machine Tool Co.

2363 UNIVERSITY AVE.

ST. PAUL 4, MINNESOTA

Plastic Floor Patch



**Sets
Instantly!**

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There's no need to tie up plant traffic while broken concrete floors are being repaired. Durable INSTANT-USE will restore your floors to solid smoothness in a hurry. This new plastic resurfacer is ready for use almost as soon as it's put down. Bonds tight to old concrete, makes long-lasting heavy duty patch. Withstands extreme loads.

TAMP! TRUCK OVER!

Simply shovel INSTANT-USE into the hole or rut—tramp—and your floor is ready for traffic without the usual wait for setting. Keep a drum on hand for emergencies. Immediate shipment.

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OFFER**



INSTANT-USE

FLEXROCK Co.

3634 Filbert St. Philadelphia 4, Pa.
Canadian Off.: 21 King St., E., Toronto, Ont.

Please send me complete information
... details of TRIAL ORDER PLAN—no
obligation.

Name

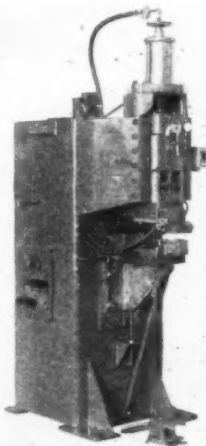
Company

Address

PROJECTION WELDER UTILIZES SINGLE CYCLE FOR OPERATION

Quality welding of kitchen utensils is being done four times as fast as before with a new projection welder developed by The Federal Machine and Welder Co.

The first model, using simplified dies, is used by one manufacturer for welding the lips to coffee pots at a rate of 4000 per eight hour day. Previous equipment produced only 1000 units in eight hours.



Only one cycle of current is used to complete the weld. The short and precise timing is controlled with a synchronous panel and the high current capacity necessary for welding light materials of large areas at short intervals of time is obtained with a special 175 KVA water-cooled welding transformer.

The Federal designed special low inertia spring head, incorporating one slide within a slide, and leaf springs, gives a very quick follow-up.

Standard T-slot platens permit quick change of dies. The adjustable non-retractable stroke cylinder makes possible the use of various sizes and designs of dies for the welding of all

Economy

DRILL JIG

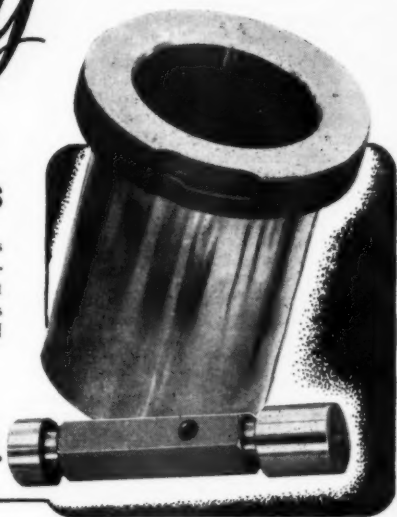
Bushings — Gages

ALL A. S. A. STANDARD types and sizes, in stock—ready for immediate delivery. Also excellent delivery on NEW GAGES and Gages salvaged by HARD CHROMIUM PLATING.

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sent promptly upon request.*

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1829 S. 68th St., Milwaukee 14, Wis.



For holes from 1/8" upward, 15 different sizes.

Made of Super-High-Speed Steel Specially Heat Treated
Indispensable for your JIG BORER. The worm-like spiral of the boring heads provides a long, useful cutting surface. Their use insures perfect fitting threads. Correctly designed for precision work.

Write for Complete Data

COMET TOOL CO.

738 Broadway

New York 3, N. Y.

types of kitchen utensils. Rapid adjustments can be made in the heights, depths, angles, etc. of the dies and holders to fit the work in process.

This insures proper positioning of the work parts with relationship of the parts to each other as well as between the parts and the dies.

The Federal Machine & Welder Co.
Dept. BB,
Warren, Ohio

ETCHING DEVICE MARKS ALL METALS

A new marking instrument for electrolytically etching trade marks, part numbers, etc. on metal has been announced. This device will mark part numbers, product names, or any other inscription that can be typed or drawn on a $2\frac{1}{2}$ " x $6\frac{3}{4}$ " stencil film.

The unit, called the E-Z-Mark, measures 9" x 11" x $7\frac{3}{4}$ ". It uses no acids, but will permanently mark steel, brass, copper, alloys, and other non-ferrous metals. A single stencil can be used for marking several hundred flat or round pieces. The operation consists of placing

the piece to be marked on the film stencil and pressing a button. Switches are provided for continuous operation or single piece marking. The entire unit



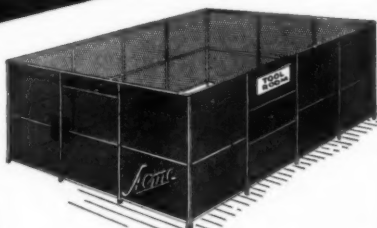
is portable, with a self-contained rheostat and ammeter. It is provided in models for 115 or 230 volt a.c. operation. For complete data, write:

Crown Industrial Products Co.,
Dept. BB 1507 E. 53rd St.
Chicago 15, Ill.

LEADERS FOR HALF A CENTURY

TOOL CRIBS and PARTITIONS

Standard Sections Woven Wire Mesh Panels and Doors to enclose Tool Cribbs, Stock rooms and other enclosures.



IMMEDIATE DELIVERY

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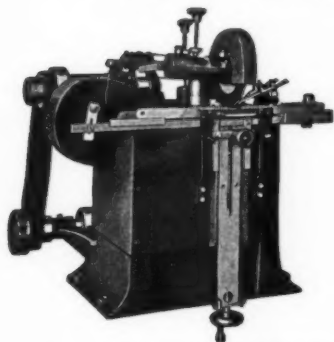


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3519 E. CANFIELD

DETROIT 7, MICH.

E. C. Saw Sharpener Can Reduce Blade Inventory by 80%



E. C. automatic metal saw sharpener is capable of sharpening hack, band and circular saws with unmatched precision.

Will not burn, anneal or in any way injure hardness of tooth. Blades cutting stainless steel 4" sq. billets have been used 250 hours when resharpened at 8 hour intervals.

Write for bulletin E.C.

THE WARDWELL MANUFACTURING CO.
3165 Fulton Road, Cleveland 9, Ohio

IT'S EASY TO TAKE THE GRINDER TO THE WORK



The Marschke Heavy Duty Swing Frame Grinder is easy to maneuver and gives maximum metal removal. Massively constructed for long, dependable service, this Marschke Grinder provides smooth true wheel rotation for steady contact between the wheel

and the work . . . gives minimum wheel wear. Provision is also made for adjustment of wheel surface speed to compensate for wheel wear.

Simplicity of construction, plus balance and maneuverability, contribute to efficient operation. These Marschke Grinders quickly pay for themselves and give many years of trouble-free service.

Other Marschke Grinders available include pedestal and floor stand grinders and buffers and the "In-Between" Grinder.

Write today
for complete
details

**VONNEGUT MOULDER
CORPORATION**

1805 MADISON AVENUE

INDIANAPOLIS, INDIANA

9 ways to speed production on tough jobs!



H-6, 1/2 H.P. multi-speed, Timken bearing countershaft, 825 to 3400 R.P.M.



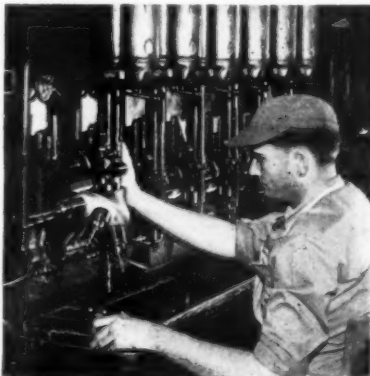
Yes, production steps up and costs go down in a hurry—especially on time-consuming "tough" jobs—when you use any of the nine different Haskins Flexible Shaft Machines marked "heavy duty." For this equipment has all the direct- or countershaft-driven power needed for grinding rough welded joints, sanding large areas or doing heavy scratch brush work.

Powered by motors that range from 1/2 H.P. to 1 1/2 H.P., these continuous production machines also do a thorough job on precise work. Find out now about the complete line of Haskins equipment. Ask for your copy of Haskins Catalog on Heavy Duty Machines. R. G. Haskins Company, 2645 W. Harrison St., Chicago 12, Ill.



LIGN-O-MATIC SELF-CENTERING DRILL TURRET

An automatically aligning drill press turret has been released by Howe & Fant, Inc., under the trademark Lign-o-matic. This unit is so constructed that its six spindles are automatically centered and aligned by the drill press spindle. The turret thus has a sustained accuracy equivalent to the drill press to which it is attached. The spindles are mounted on specially designed floating bearings so that they are free to move laterally and angularly as well as rotate. As the tapered driving unit, attached to the drill press spindle, engages the mating taper of a Lign-o-matic spindle, it centers and aligns the Lign-o-matic spindle and locks it in that position until the drilling operation is completed.



The driving power is transmitted directly from machine spindle to Lign-o-matic spindle by the same tapered surfaces that accomplish alignment. These mating tapers are hardened and ground to mirror finish with an accuracy of 0.00015". They will turn a 1/2" drill through the hardest material without a lead hole and yet will disengage for indexing without stopping the motor.

Lign-o-matic is simple to attach and detach and in no way damages the drill press. Six different drilling operations

may be performed, without the operator leaving his seat or moving the work. Tool changes are made simply by raising the drill press lever and indexing the turret to another station.

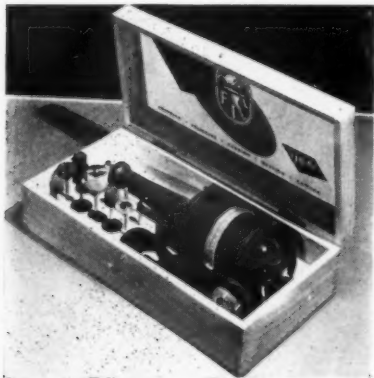
For details, request Bulletin 483, Dept. 112:

Howe & Fant, Inc., Dept. BB
521 Flaxhill Road
South Norwalk, Conn.

FAIRCHILD GRINDER ATTAINS 20,000 R.P.M.

The Fairchild electric grinder, a versatile hand tool which is capable of accurate work on a variety of operations, has been recently announced. Offering streamlined balance, and chatterproof operation permitting precision work without fatigue to the operator, the Fairchild grinder incorporates the following features:

Sealed ball bearing at the point of greatest load; self-aligning, vibration-absorbing neoprene coupling; armature and field coils of weather-resistant Formex wire; universal type 1/20 h.p. motor, dynamically balanced to insure



smooth operation at 20,000 r.p.m. Alignment accuracy is insured by fabricating the chuck and shaft in one piece. For complete details, write:

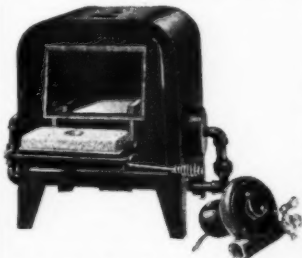
Fairchild Industries, Dept. BB
110 Main St.
Burlington, Vt.

Quick Acting **JOHNSON FURNACES**

1500° F. in 5 Minutes

2300° F. in 30 Minutes

JOHNSON Hi-Speed No. 70 BENCH FURNACE



Designed primarily for high speed steels this powerful Quick-Acting JOHNSON Furnace is equally efficient for heat treating carbon steels, dies, tools, and small metal parts. Brazes carbide tipped tools. Wide temperature range easily regulated with accuracy. Saves time and gas. Firebox 5 x 7 $\frac{3}{4}$ x 9. Furnished complete with Carbofrax Hearth, G.E. Motor and Johnson Blower.

No. 70 Hi-Speed Bench Furnace
.....\$105.50
F.O.B. Factory

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JOHNSON GAS APPLIANCE CO.

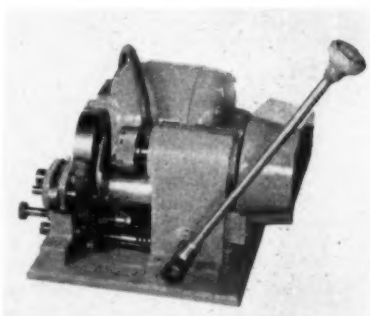
570 E Ave. N. W., Cedar Rapids, Iowa

PINES SEMI-AUTOMATIC TUBE DEBURRING MACHINE

A manually operated, bench type, tube and rod-end finishing machine is announced. The design embodies a new type mechanical chuck and chuck closing mechanism which positively holds any length tube, pipe or rod up to 2" in dia. With the work firmly held, deburring, chamfering and facing can be completed separately or simultaneously in a single pass. This results in improved part finish, simplifying subsequent assembly or machining operations.

The work clamping is accomplished by closing the chuck jaws which are equipped with a split type insert to fit individual work piece diameters. Controlled clamping pressure of the insert against the outer wall of the piece prevents distortion. Chuck inserts are available for any diameter tube or rod within the 2" range, or the inserts may be modified to receive short pieces as well as bent and unusual shaped work sections.

Production can be accomplished at the rate of 500 to 1000 ends per hour, depending upon the size and length of the stock, the cut taken, and the type of material.



A change of cutting tools or a change of inserts to accommodate various diameters requires approximately one



LINLEY

FOR NOISELESS, HIGH SPEED, RIVETING

Rotary spinning principle shapes uniform heads, silently... capacities up to 3/8 inches diameters. Adjustable spindle stroke, controlled pressure... double row radial thrust bearing supports spindle, assures long life. Table elevating screw prevents slipping. Six floor or space-saving bench models...sturdily built for trouble-free operation under severe production schedules.

FOR COMPLETE INFORMATION,
WRITE FOR BULLETIN.

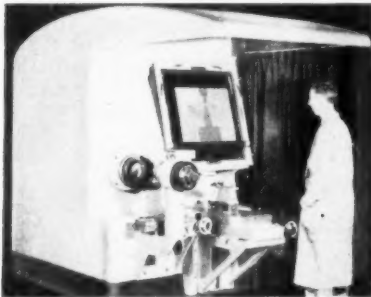
LINLEY BROTHERS CO., 663 STATE ST. EXTENSION
BRIDGEPORT 1, CONNECTICUT

minute. The chuck inserts are held in place by thumb screws. The tool holder is slotted to receive three cutters. These are adjustable and may be set to compensate for different wall thicknesses. The holder has a threaded shank which screws into the machine spindle. It also has a tapered recess to receive the matching taper of the tool holder body. The flexibility of the machine in handling numerous operations makes it possible to meet high production requirements for tube and bar stock alike. For complete details on this new unit, write:

**Pines Engineering Co., Dept. BB
Aurora, Ill.**

PROJECTION LENS FOR BLADE CHECKING OPTICAL COMPARATORS

Highly successful results are being obtained from a recently designed 434 mm. Projection Lens, used on the Special Blade Checking Optical Comparators designed by Jones & Lamson Machine Co., for inspecting foil contours on turbine blades. This new lens system will take in a 6" diameter inspection area and project it at 5 magnifications on a 30" square screen. The lens aperture is 6 5/8" in diameter. It has a



back focal length, or working clearance of 12 1/2". A specially designed condensing lens is a part of this equipment. For complete information:

**Jones & Lamson Machine Co.,
Dept. BB
Springfield, Vermont**



TORQUE THUMB SCREWS



Because the Vliet Torque Thumb Screw automatically limits end pressure, assuring whatever accurate holding tension is desired, avoiding work distortion, preventing costly rejects, and eliminating expensive fixture rework costs, it is fast replacing all types of conventional screws for clamping or supporting work during machining.

INVERTED TYPE B
(for use with sliding V-blocks)

TEE HEAD TYPE C
(for use with sliding V-blocks)

17 sizes, individually boxed, offers various types and end pressures required.

SPRING PLUNGERS AND SPRING STOPS



Standard threads for mounting in fixture walls. Simply tap mounting hole, screw spring plunger in position and lock with nut or set screw. Rounded plunger nose permits easy insertion of workpiece and spring pressure maintains tight, firm contact. Hardened plunger ends, telescope within body. Rust-proofed. Individually boxed.

Use of the Vliet Spring Stop where no wall sections are available. Plungers are jig drilled for bolting to fixture bases. Plunger and hardened. 14 lbs. end pressure. Rust-proofed, packed 6 to a box.



MULTI-DIMENSIONAL FIXTURE KEY

Counterbored hex nut having stepped sides. Milled from oversize stock in order to maintain close tolerance of $\pm .0005$ between stepped sides — assuring perfect alignment. Each pair of stepped sides form three individual key widths which fit a standard table

slot. Two Keys in any fixture can be readily used on three different machines having varying slot dimensions.

Write today for detailed descriptive literature and location of nearest Vliet supply house.



VLIET MANUFACTURING CO.

Manufacturers of Production and Tool Specialties

4332 SEVERLY BLVD., LOS ANGELES 4, CALIFORNIA

ROGERS NT-20 FACE GRINDER

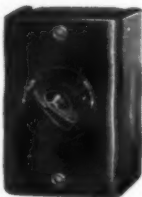


for FAST GRINDING Short Sections of IRON and STEEL Parts

A medium duty, high production grinder. Handles solid sections up to 12" high, 16" wide, 72" long. Extra power in 10 H.P. motor. Equipped with high quality 20" disc wheel.

ELECTRONIC SPEED ADJUSTMENT GIVES QUICK — POSITIVE CON- TROL OVER TABLE TRAVERSE

Dial can be pressed for any speed from 10 to 70 ft. per min. Motor comes to pre-set speed **smoothly** . . . **quickly**. Speed can be changed any time while machine is running. Reversals absolutely without vibration.



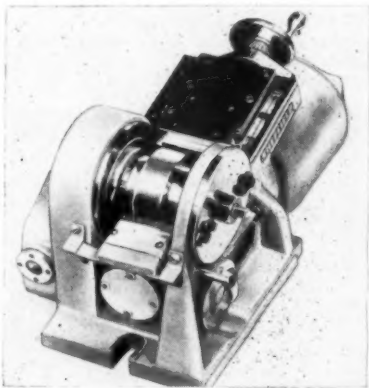
*Pioneer Manufacturers of Knife and Face
Grinding Machinery Since 1887*

**SAMUEL C. ROGERS
& CO.**
207 Dutton Ave. Buffalo 11, N. Y.

CRUSHING DEVICE FOR FORMING GRINDING WHEELS

A new self-truing motorized crushing device for forming cast iron "crush-true" rolls and "crushtruing" grinding wheels is announced by the Sheffield Corp. It is a self-contained, two-speed unit employing a carbide tool for dressing the form of a Meehanite, or other close grained cast iron, roll, which is then used to crush the grinding wheel—all without removing the roll. The device is designed for mounting on the table of an 8" x 24" or larger wet type surface grinder.

In certain cases of simple shallow profiles it may be possible to form the blank roll directly with the carbide tool. Normally, however, it is recommended that the roll be rough formed on a lathe, then finished formed in the crushing device. As the roll becomes worn from repeated grinding wheel truing, the operator simply shifts the clutch to low speed and feeds the carbide tool slowly into the roll until the



original form is fully restored. This is accomplished within three to five minutes. One of the chief advantages of this new crushing device is that all elements of the form are held precisely during the grinding of quantities of parts. This is especially important in grinding thread-rolling dies, laminated sections,

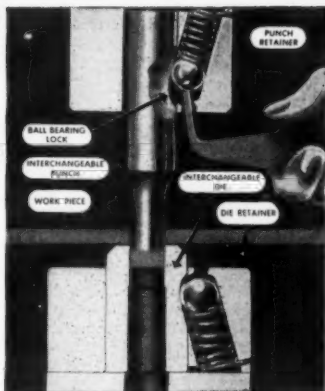


INTERCHANGEABLE PUNCHES and DIES

**Quickly Inserted...
Rigidly Held!**

Allied's R-B Interchangeable Punches and Dies are quickly inserted—rigidly held for accurate, trouble-free punching in the metal-working and plastics industries. They are available from stock in standard round, oblong and square shapes of almost any required size. Specials of any size, shape or material are promptly furnished to your specifications . . . and delivery dates are dependable.

Large, illustrated R-B Catalog gives complete details, specifications. Write for it.



ALLIED PRODUCTS CORPORATION

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SAVE HANDS WITH STRANDS

**SAFEGUARDS
FOR PUNCH
PRESSES**

*Send for Enclosure
and
Sweep Safeguard
Circulars.*

STRAND MFG. CO., INC.
SAFETY ENGINEERS

607 W. Lake Street, Chicago 6, Illinois

punch and die sections, or any flat or cylindrical work of irregular contour. For further information write:

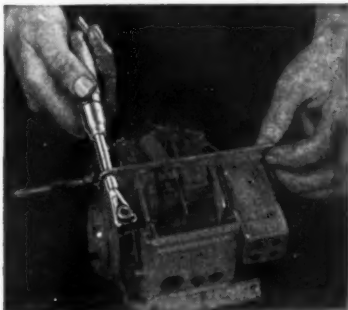
Sheffield Corp., Dept. BB
Dayton 1, Ohio.

NEW TOOL SIMPLIFIES GROMMET INSERTING

A new tool, especially designed to simplify grommet inserting operations, is announced. This Grommet Inserter was developed to supply the need for an efficient hand tool to overcome the difficulties involved when inserting grommets into panels, chassis, etc.

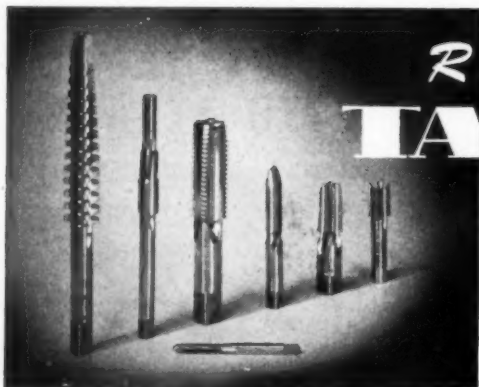
The operator merely slips the nose of the tool through the hole which is to receive the grommet, places a grommet into the claw nose, withdraws the tool, and the grommet is automatically inserted in position. No preparatory treatment of the grommets is necessary. Snug fitting is assured because under-size grommets need not be used to make inserting easier. Damage to grommets ordinarily caused by forcing and jamming is eliminated.

The tool is durably constructed to withstand hard use; the tempered steel inserting claw has only one moving part, nothing to get out of order. It is



available in four standard sizes, for inserting $\frac{1}{4}$ ", $\frac{5}{16}$ ", $\frac{3}{8}$ ", and $\frac{7}{16}$ " grommets. Special sizes are available, made to order. For complete details, write:

D. B. Rich Mfg. Co., Dept BB
6217 N. Melvina Ave.
Chicago 30, Ill.



R & N TAPS

Next time try R & N Taps.

Give long life, dependable service and are the favorite with hundreds of the largest and most exacting users.

Buy Reiff & Nestor Taps and get the benefit of wide experience, progressive engineering and precise workmanship.

Our stepped up production enables us to make prompt deliveries on both Standards and Specials.

REIFF & NESTOR COMPANY

manufacturers of TAPS AND REAMERS
LYKENS, PA.

CLUTCH TAPPER



WITH THE **NEW**

Cap. No. 10 to 5/16"

Friction \$35.00

Positive \$30.00

Other Tappers To 2"

JACOBS

**RUBBER FLEX
TAP HOLDER**

Also Multiple Drilling & Tapping Heads, Die Heads, Stud Setters, Automatic screw drivers & nut setters, Quick change chucks.

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170 BROADWAY

PARTS DRAWN OF STAINLESS STEEL OR OTHER METAL PARTS PRODUCTION



HERE'S WHAT WE CAN DO FOR YOU.

We are equipped to produce at low cost, deep draws in stainless steel, aluminum, sheet steel, etc. It is routine production to hold wall thicknesses and tolerances to close limits. Therefore, it is possible for us to adhere to the most exact specifications. We are producing Stainless Steel pen and pencil caps for one of the leading Manufacturers and many other items for varied industries.

Write for further information

PARTS SHOWN ONE-HALF SIZE

KANKAKEE TOOL AND DIE WORKS, INC.
MFRS. OF METAL PARTS - DEEP DRAWING - STAMPING - FORMING

367 SCHUYLER AVE.

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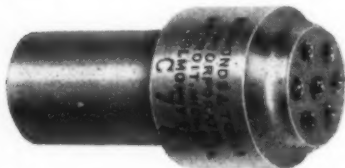
KANKAKEE, ILLINOIS

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

243

NEW DIAMOND WHEEL DRESSING TOOL

Diamonds & Tools, Inc. announce the latest addition to their line of diamond dressing tools, the C-7X or "Mighty Mite". This tool provides a new conception of wheel dressing costs on large diameter and broad faced grinding wheels. Heretofore it was thought necessary to use either a large single point diamond dresser or a cluster tool when dressing wheels of this type. With the development of this new C-7X dresser it is possible to do the same job with a less expensive tool.



The tool contains seven diamonds with a total diamond weight of between 1-1/3 to 1 1/2 carats. The shank dia-

meter is 7/16" and the diamonds are set in Colmonoy metal. The C-7X is designed for dressing wheels on centerless grinders, large o.d. grinders and surface grinders. Full information can be obtained from the manufacturer:

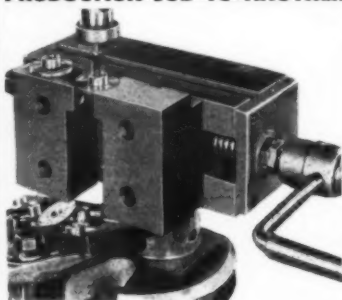
Diamonds & Tools, Inc., Dept. BB
19345 John R St.
Detroit 3, Mich.

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A recently developed alloy, Magnolia Isotropic Bronze, die cast by an exclusive metallurgical process, consists of a more homogeneous structure than that of ordinary bronze stock. The process eliminates the possibility of bars containing tiny hard points of sand embedded in the structure; such material would ruin cutting tools and wear down shafts.

This bronze withstands great strains. It presents a uniform surface free of blow holes, cracks, or spongy material. Isotropic Bronze is carefully alloyed from high grade copper, tin, and lead;

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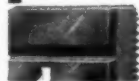
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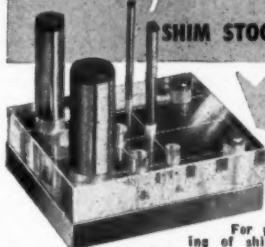
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ACCURATE ALIGNMENT is assured because the clear plastic top enables the operator to actually see the work. Overall size: $1\frac{1}{4}" \times 3" \times 3\frac{1}{2}"$, which provides for the following standard size holes: $\frac{1}{8}"$, $3/16"$, $\frac{1}{4}"$, $5/16"$, $\frac{3}{8}"$, $7/16"$, $\frac{1}{2}"$, $5/8"$, and $3/4"$. Special sizes built to your specifications. Write today for full details . . . and begin to enjoy the advantages which only the **TRANSPARENT Shim Stock Punch** can give your plant.

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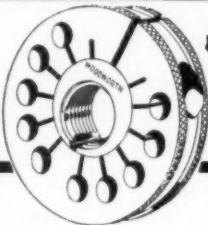
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245

the element of zinc, which sometimes causes scoring, is absent from the formula.

Magnolia Bronzes are available in over 700 stock sizes, including both solid bars and tubing, in sizes from 1" o.d. up to 16" o.d. The standard stock length is 13", although lengths up to 40" are available in some sizes. Thin walled bars and shoulder or flanged bushings roughed to dimensions can also be provided. Illustrated bulletin giving complete details is available upon request.

Magnolia Metal Co., Dept. BB
18 W. Jersey St.
Elizabeth 5, N. J.

NEW FALCON T. I. DRIVE HAS HIGH RIGIDITY

The Falcon Tool Co. announces the new Falcon Taper Interchangeable Drive. Its superiority rests not so much in its material and workmanship as in the speed with which it can be assembled and dis-assembled. A slight twist of the wrist, and the tool is solid-

ly in place. A slight turn in the reverse direction, and it's out.

The speed and accuracy of the Falcon T. I. Drive can be proven by its continuous use for over a year in several prominent machine shops, which have served as a veritable proving ground. According to many experts, the T. I. Drive is one of the most rigid combinations in use today.



The device's extreme rigidity makes it useful for interchangeable carbide counterbores and step cutters. For complete specifications, write:

Falcon Tool Co., Dept. BB
12502 Greiner St.
Detroit 5, Mich.

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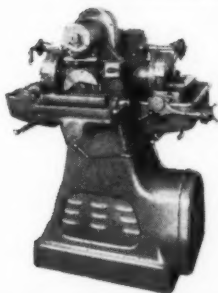
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All Baumbach Die-Sets have demountable Leader Pins and Bushings. This exclusive feature permits removing Leader pins for machine work on the die shoe and assures reassembly without loss of alignment. A big time and trouble saver. Write for Catalog.

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Here's tool grinding at its best!

Employing 3-step progression—rough, semi-finish, and finish or hone—on one machine, this LeMaire 3-Wheel Grinder produces keener edge in fraction of time. Because tools go to diamond wheels in better condition, life of diamond wheels is considerably lengthened. Both labor and wheel costs are reduced—time is saved—production is increased.

Wouldn't you like to know more about this remarkable 3-Wheel Grinder? Send for descriptive folder.

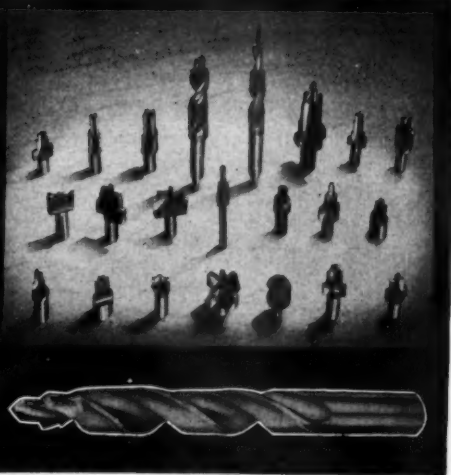
LeMaire Tool & Mfg. Co.

2657 S. Telegraph Road
Dearborn, Michigan

Designers and builders of unit and way type machines for single or multiple spindle drilling, boring, reaming, tapping, etc.—Twin Ram Hydraulic Units—Match-it Gear Chucks.

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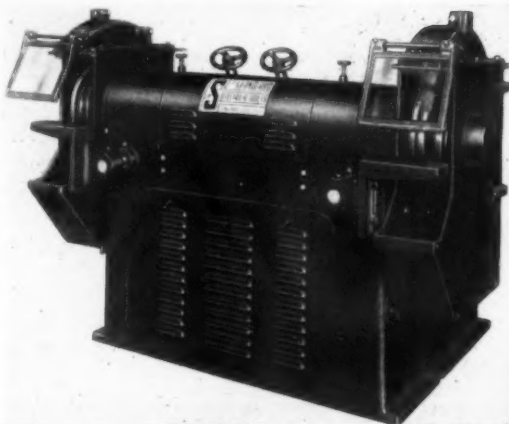
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DUAL MOTOR SNAGGING GRINDER REDESIGNED

A complete redesign of the No. 35 Twin-Motor Infinitely Variable Speed Snagging Grinder is announced by the Standard Electrical Tool Co.

This unit is a 2-in-1 machine; each operator is entirely independent of the other; one side of the machine may be stationary while the other wheel is operating; one side may be operated with a wheel differing in diameter to the other side; but each wheel is operated at its correct and efficient peripheral speed.

The No. 35 has two independent spindles, two 7-1/2 h. p. motors, two magnetic starters, two start-stop push button stations, two shaft locks for use in changing wheels, two infinitely variable speed drives, two hand



wheel speed controls, two interlocking arrangements to prevent over-speeding of the grinding wheels.

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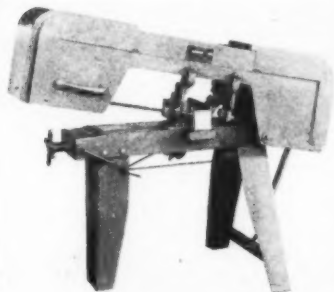
Detroit 1, Michigan

The speed control is an interlock making it impossible to operate the wheels in excess of the recommended speed. As the individual grinding wheel wears, guard is adjusted, upon turning the hand wheel speed control; the limit-stop reflects the correct spindle speed in relation to the worn wheel diameter; speed change can be made at random, always reflecting the correct peripheral speed. Full diameter wheel cannot be mounted until the hand wheel speed control has been reversed to its original position. This allows the wheel guard to be brought to its extreme forward position to permit clearance for the full diameter wheel. For further data, write:

The Standard Electrical Tool Co.
2486 River Road
Cincinnati 4, Ohio.

METAL CUT-OFF BAND SAW HAS THREE BLADE SPEEDS

This new Metal Cut-Off Band Saw is designed to cut off metals up to a capacity of 5" x 10". It is equipped with a box type frame with the wheel assemblies mounted high on welded steel brackets bolted to the frame. The bed is 7" wide by 28" long, and is set on a three-point base to insure both freedom from torsional strain, and accuracy despite uneven floor conditions. A



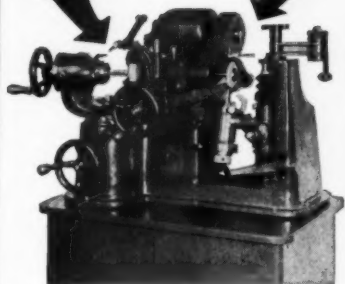
built-in hydraulic unit gives correct feed for every section, and a stock stop gauge is provided for duplicate cutting.

All controls are within the operator's reach; fully guarded wheels provide

THE New MODEL 1100 HYBCO TAP GRINDER

ACCURATELY GRINDS
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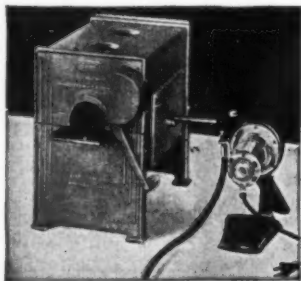
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High Speed Muffle Furnace

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in 20 minutes*



No. 1 Furnace, as shown, muffle opening $7 \times 3\frac{1}{8} \times 2\frac{1}{8}$ " complete with independent blower or torch and metal gas hose. \$80

No. 2 Furnace, muffle opening $7 \times 4\frac{5}{8} \times 3\frac{1}{2}$ " with built-in blower & gas hose. \$148.

Operate on city or tank gas for 7 to 10 cents per hour. Built of best materials, they do high grade small work handily and efficiently

Adequate pyrometer equipment extra, if desired.

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safety. The unit operates and shuts off automatically. Even inexperienced help can operate this machine efficiently.

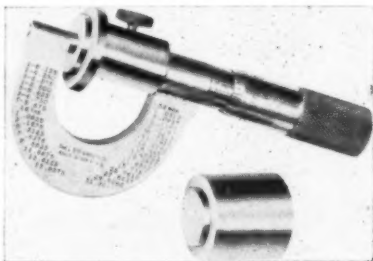
Three blade speeds are provided: 45, 90, and 150 feet per minute, giving suitable speed for every material. The machine is portable, and the net weight is only 235 lbs. Casters can be furnished, if desired.

The Johnson Model B Band Saw, including hydraulic control, and 1/3 h.p. motor is described in a new catalog available upon request to:

**Johnson Manufacturing Corp.,
Dept. BB Chrysler Bldg., Room 639
New York 17, N. Y.**

PRECISION DEVICE FOR LAPPING MICROMETERS

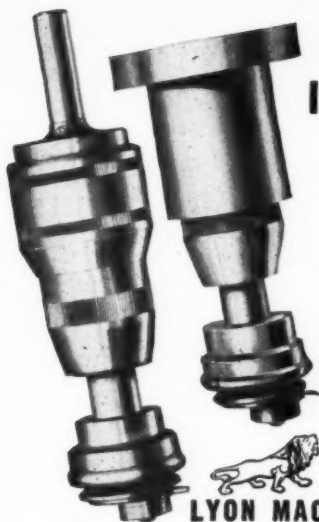
The Mic-Lap is a patented precision tool for lapping micrometers quickly and accurately. To lap a pair of micrometers so that they will measure correctly, a method must be used to make the measuring surfaces of the spindle and the anvil parallel to each other, and at right angles to the axis of the



spindle. This cannot be done simply by lapping them together.

The Mic-Lap embodies features enabling anyone competent to use a pair of micrometers to lap the anvil and spindle bottom not only parallel but to a ninety degree angle to the axis of the spindle. For additional data, write:

**The Mic-Lap Co., Dept. BB
68 Devonshire St.
Boston, Mass.**

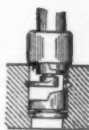


The Lyon INTERNAL GROOVING TOOL

Its versatility saves costly preparation time — provides precision grooving of single or multiple grooves at a production rate — plus economy of set-up time — and low initial cost. The LYON has been designed for making internal grooves to tolerances of .001" using any drill press, turret lathe, radial drill or automatic equipment.

By changing only bushings and cutters within the tool model range, you have at your command a wide variety of bore sizes and shapes. A simple adjustment regulates location and depth of groove. Work cannot be scratched or marred because the head of the tool does not turn when the cutter operates.

Our Engineering Department will welcome the opportunity of discussing any grooving problem without obligation.



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LOCATED FROM
BOTTOM OF
HOLE

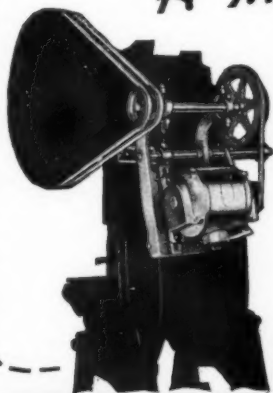


SINGLE GROOVE
LOCATED FROM
TOP OF HOLE

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A Modern

MOTOR DRIVE FOR EVERY MACHINE TOOL



The Modern Motor Drive shown here fills an urgent demand for an easily mounted economical Punch Press Drive.

Utilizing the jackshaft principle, permitting the use of standard 1750 R.P.M. Motors.

Brackets for direct drive from motor to flywheel are also available from stock.

Write for catalog showing complete line of Modern Drives for other machine tool equipment.

THE NICHOLS ENGINEERING COMPANY...
2400 W. MADISON ST. CHICAGO 12, ILL.

AUTOMATIC COOLANT CLARIFIER FOR METALWORKING TOOLS

The Honan-Crane Automatic Clarifier removes abrasives, dirt, and other contamination from water soluble coolants used in metalworking tools. The coolant is filtered under pressure through mesh screens of Monel "Dutch" weave wire cloth. The passageways in the 250 and 496 mesh screens are so small that a coating of particles quickly builds up on the screen surface between blow-down periods. The filtering efficiency of the screens increases as the particles so removed build up and form a porous coating which, in itself, becomes a filtering medium. It is possible to remove particles as small as 5 to 10 microns.

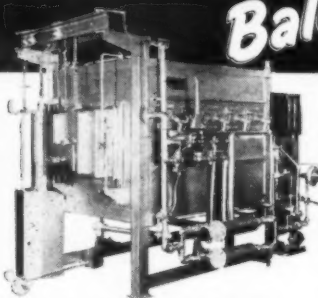
Abrasives are permitted to build up on the screen for a predetermined time, dependent on the character of the particles and amount of contamination present in the coolant. At the end of this predetermined period, an electric timer actuates the blow-down mechanism, which consists of clean coolant being forced, under pressure, back against the filtering screens. This forces ab-

rasives off the screens and they are



carried along with the liquid out of the clarifier. At the end of the blow-down

Balco The New Controlled Carbon ATMOSPHERE FURNACE



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- LEAST INVESTMENT

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figures.

2634G

The new Balco Furnaces provide clean, scale-free hardening, gas carburizing, and carbon restoration of plain and alloy steels. This is accomplished by the accurate control of the carbon potential of the atmosphere.

The Balco Furnace is a Standard-Rated, Gas-Fired Atmosphere Furnace of the muffle type with an integral RX atmosphere generator, and is available in three types—two for clean hardening and one for gas carburizing. Of the former, one type has a temperature range from 2000° to 2400° F, the other from 1400° to 1850° F. The range of the gas, carburizing, furnace is from 1400° to 1850° F.

The Balco Furnaces make available to the small furnace user a multiple-purpose unit for clean hardening, gas carburizing, carbon restoration and other carbon controlled heat treatments. One such Balco unit in operation in a large commercial heat treating plant has successfully processed 67 different grades of tool steel.

'Surface' Standard Rated
FURNACES
SURFACE COMBUSTION CORPORATION, TOLEDO 1, OHIO

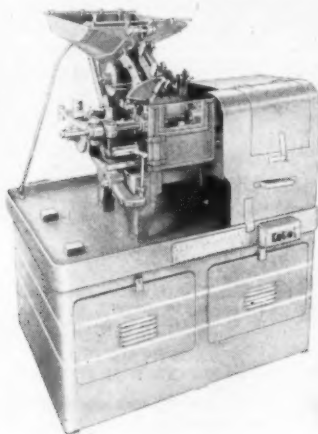
period, which lasts about 5 seconds, this procedure is reversed, and the flow of coolant to be filtered starts back through the clarifier. Coolant expended in the blow-down process is refiltered and practically none is lost. The entire operation is automatic, and requires no attention from the operator.

For complete details on this new unit, write:

Honan-Crane Corp., Dept. BB
911 Sixth St.
Lebanon, Ind.

TOWNSEND AUTOMATIC HIGH SPEED SHAVER

The most recent development in the Townsend line of automatic machines is the High Speed Shaver, a unit designed for extreme precision, rapidity and flexibility in second operation work. Forming, chamfering, shaving, facing, grooving, pointing and drilling are among the operations which can be performed



automatically. All types of headed and turned parts can be handled. The production capacity ranges from 30 to 90 pieces per minute.

The shaver utilizes a hopper, 24" x 17" x 7" which will handle most sizes of headed parts. The hopper blade feeds

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with

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DEPENDABLE

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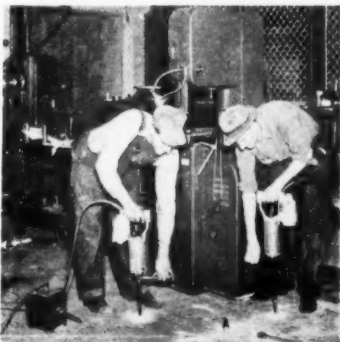
Drilling Bolt Holes to Anchor Machinery and Shafting.

Cutting Holes for Steam Pipes, Water Pipes and Air Lines.

Channelling for Conduit
—and a host of other time
and labor-consuming jobs.

Illustrated folder on request

SYNTRON CO. 300 Lexington
Homer City, Pa.



the work into a track where the pieces are picked off and brought down to the spindle with either the head or the shank being chucked. The machine will accept blanks from 1/16" to 13/16" in diameter, and from 3/16" to 3 1/2" long. Since the feed and chucking mechanisms are completely automatic, one operator can be used interchangeably on the of these machines.

Either a collet or jaw type spindle can be used interchangeably on the High Speed Shaver. The jaw type is recommended for those pieces which cannot be chucked in the B & S No. 11 collet which is used on the machine.

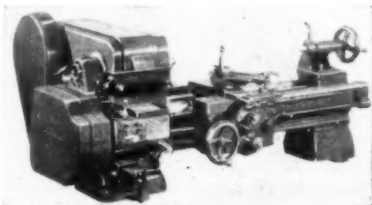
The unit is mounted on a compartmented base which contains the main spindle motor drive, the variable speed camshaft drive, as well as the control box and the coolant pump and tank. Both the spindle and variable speed motors are 3/4 h.p., 1800 r.p.m. types.

For complete specifications, write:

The H. P. Townsend Mfg. Co.,
Dept. BB
Hartford 1, Conn.

SHELDON 10" PRECISION BENCH LATHE

Sheldon Machine Co., manufacturers of Sheldon Precision Lathes and Sheldon Vernon Milling Machines and Shapers, announce a new 10" bench lathe with a 1-1/16" spindle hole, and an integral horizontal motor drive.



Basic features include a 3/4" collet capacity (1" collet capacity with nose type collet chuck), tapered roller spindle bearings, double-walled worm feed apron with power cross feed, full quick change gear box that gives a thread cutting range of from 4 to 224 threads per inch. The 4-step V-belt motor drive is

BIG NEWS ANNOUNCING 1 1/2 INCH CAPACITY

Levermatic **COLLET CHUCK** FOR ALL TURRET AND ENGINE LATHES

Added to
**THE OVERWHELMINGLY
APPROVED 1-INCH SIZE
RECENTLY INTRODUCED**

**PROVED STEPPED UP
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- Assures greater speed and accuracy
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- Simple finger-tip adjustment

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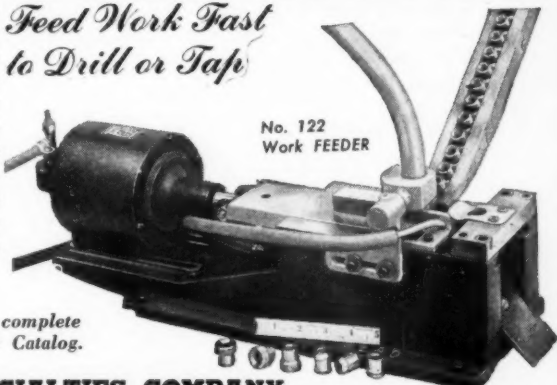
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Chicago 12, Illinois

Manufacturers of Collets and Fingers for 25 Years
West Coast Office: PORST SALES, 132 W. Union St., Pasadena 1, Calif.

MONEY-MAKING WORK FEEDERS

This model provides a gripping force 12 times the line pressure at work station. Alternative chutes handle two different shapes without dismantling. Combines with Meadmatic Timer and Drill Press Feed, for semi-automatic production.

*Feed Work Fast
to Drill or Tap*



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Work FEEDER

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**"The Outstanding Basic
Improvement in FLEXIBLE SHAFT
Machinery in 25 Years"**

The NEW Strand Rotoflex 4-speed gear drive Flexible Shaft Machine (shown upper right) is another step forward in Strand quality precision tools for faster, easier, more economical production work. The Rotoflex 4-speed gear drive employs a patented, new type of quick change gear drive utilizing 4 positive speeds by a unique and easy method of instantly changing from one speed to another. Rotoflex machines are powered with totally enclosed ball-bearing motors having speeds from 850 to 9000 R.P.M., depending on motor.

Standard type Strand machines, (lower right) give portable rotary power at constant speeds with dependable results in all grinding, buffing, drilling, wire brushing and rotary filing operations. Hundreds of types and models from 1/8 to 3 H.P. available with suitable attachments for your specific requirements.

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5016 NO. WOLCOTT AVE.
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designed to take either a 1/3 or 1/2 h.p. motor.

This small, capable machine tool is recommended not only for small shops, but for tool rooms, die shops, and for production work in large plants as supplementary equipment. For complete specifications, write:

Sheldon Machine Co., Inc., Dept. BB
4258 N. Knox Ave.
Chicago 41, Ill.

COMPLETE ELECTRIC DRILL KIT

Portable Electric Tools, Inc., announces their Hi-Power Model 77 Electric Drill Kit consisting of their own 1/4-inch portable electric drill and ten high-speed drills all arranged in a handy steel, hinged-cover carrying kit.

The case is strongly constructed of 22-gauge steel, electrically welded for added strength. It is enameled on the inside with a black, fine-wrinkle finish on the outside. The cover is hinged by a full-length, piano-type hinge. A lever-type latch holds the case closed.

A substantial metal, saddle-type holder for the electric drill also carries the rack for the drills. This bracket is easily removed from the case as a unit for conveniently setting on a bench or



ladder or when the case is put to other use. Further particulars and descriptive bulletin from:

Portable Electric Tools, Inc.
255 W. 79th St., Dept. BB
Chicago 20, Ill.

BUFFALO PNEUMATIC CHIP GUN

**A NEW METHOD OF REMOVING
CHIPS FROM BLIND DRILLED AND
TAPPED HOLES.**

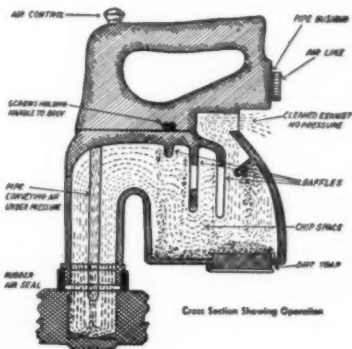
**SAFE! CLEAN!
EFFICIENT!**

Eliminate the danger to your workmen from flying chips by removing your cuttings with the BUFFALO PNEUMATIC CHIP GUN. Simply place the nozzle over the hole, release the air by thumb pressure and the cuttings are deposited in the body of the gun.

Available in two sizes:

Model A—For 1/4" to 5/8" dia. holes

Model B—For 1/2" to 1 1/2" dia. holes



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BACKSTANDS
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CUTS
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"W"

ACROMARK DEVELOPS NEW ENGRAVING TECHNIQUE

New technique of limited depth engraving has been adapted to flat face lettering and design. Deviation from sharp face to flat face engraving is now possible in limited depth engraving without the disadvantage of throw-up of metal in stamping, lettering and design.



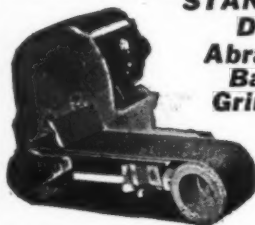
The illustration shows two steel stamping dies for stamping thin, nickel plated brass harmonica cover plates

with an intricate design and lettering of flat broad face. These dies are cut from a solid bar of alloy tool steel in such a manner that the grain of the steel runs lengthwise of the shank thereby giving maximum strength to the engraved face. Each die is turned and machined from one piece and beveled to the engraved face. Enough steel is removed from the blanks to get to the central core and then the face is machined to a level plane, perpendicular to the shank.

The background of the face is then removed by "pantograph type" engraving machines working from a master design at a substantial ratio for accuracy and to a limited controlled depth. The background is finished to a smooth finish in the engraving machine and then each die is hardened and drawn to predetermined hardness.

After heat treatment the faces of the lettering and design are ground in pre-

STANDARD D-4 Abrasive Band Grinder



Famous
for
Stamina

This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood, fibre... at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood 4x36 1/4" band. The ideal portable unit.

OTHER STYLES AND SIZES IN NEW MANUAL ON FINISHING—WRITE TODAY

WALLS SALES CORP.

306 E. 38th St., New York 16, N. Y.

Immediate Delivery FROM STOCK GREAVES-SILENT BAKELITE GEARS



No waiting when you order Greaves Silent Bakelite Gears. • We have them in stock NOW! • Your order will go forward immediately. • You'll appreciate the silent operation and added smoothness provided by Greaves Silent Bakelite Gears. • You'll marvel at their great strength to carry big power loads... their remarkable ability to successfully operate completely submerged in water. • You'll welcome their low cost. • No metal reinforcements required. • Save Time... Money... Labor!

We also make silent gears of rawhide and Fabrolite.

Write for Circular.



Greaves MACHINE TOOL CO.

2013-18 Eastern Ave.
Cincinnati, Ohio

cision surface grinders until the lettering and design are exactly the depth of desired impression.

The Acromark Co., Dept. BB
15 Morrell St.
Elizabeth 4, N. J.

REV-TUNER MEASURES R. P. M.

This new precision instrument, guaranteed to measure accurately and quickly the rotation speed of motors, shafts, and other mechanisms, and for general use in detecting mechanical vibration—was designed by H. L. Burkhardt of Elmira, N. Y. It indicates instantly the r.p.m. of any motor, covering a range from 800 to 16,000 r.p.m. Through the use of a wood probe readings as low as 200 r.p.m. can be obtained.

The device utilizes established physical laws concerning resonate vibration. Its thin spring steel "reed" can be tuned by a thumb wheel to vibrate at any rate, or frequency, marked on a graduated scale without the necessity of figuring or mathematics. With the frame

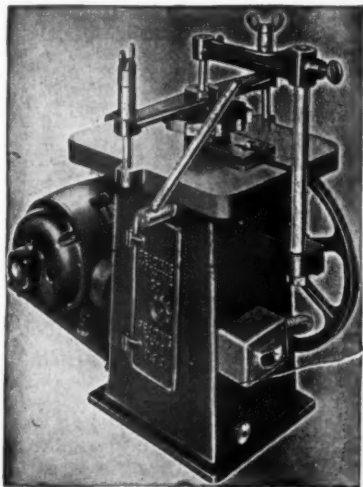


of the Rev-Tuner placed in contact with a body which is vibrating continuously at a fixed rate, or frequency, the "reed" will not vibrate noticeably until it is "tuned" so that its natural frequency coincides with the frequency at which the body is moving. No revolving shaft connections are required to get readings with Rev-Tuner. It is only 7 inches long and weighs 3 ounces; finished in baked grey, aluminized enamel.

Rev Products Co., Dept. BB
406 Market St.
Elmira, N. Y.

NO BUSHINGS, GUIDES or PILOTS NEEDED

THE READING BROACH KEYSEATER



The Reading Bench Machine requires no bushings, guides or pilots. No other machine like it. Very fast—capacity from $\frac{1}{8}$ to $\frac{3}{8}$ cutter. Prompt delivery—low first cost.

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SAVE TIME
on intricate, angular
SET-UPS

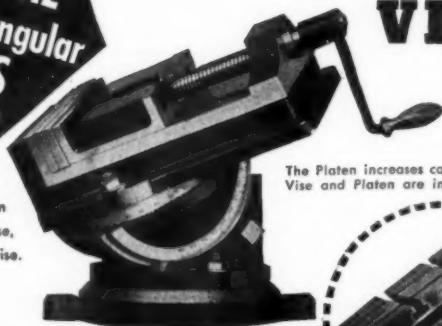
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Fully universal . . .

three swivels simplify the
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Parts interchangeable . . . can
be used as a plain flanged vise,
a swivel vise or multi-swivel vise.

Write for
name of
nearest distributor



The Platen increases capacity of the unit.
Vise and Platen are interchangeable.



MASTER TOOL CO.

161 HIGH STREET • BOSTON MASS.

DIE SHEARING PRESS

- for Cold Heading Shops, Jewelry—
a must for every tool and die shop



Simplifies making
male or female
dies — in one
fourth the time
required by usual
methods. Used for
die tryout, blank-
ing, forming, em-
bossing, and hob-
bing. Write for
descriptive folder.
Capacities to
1,000 tons.

M & N Machine Tool Works, Inc.
156 Orono St. Clifton, N. J.

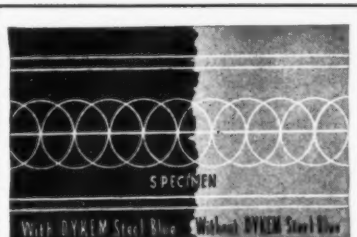
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Maximum gripping power with
extreme accuracy and long life.

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T. R. ALMOND MFG. CO.
ASHBURNHAM, MASS.
U. S. A.



DYKEM STEEL BLUE STOPS LOSSES making dies & templates

Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed layout lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

Write for full information.

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MADE OF ALLOY STEEL MILLED FROM BAR

SOCKET HEAD
CAP SCREWS



Try Them On Your Next Job!

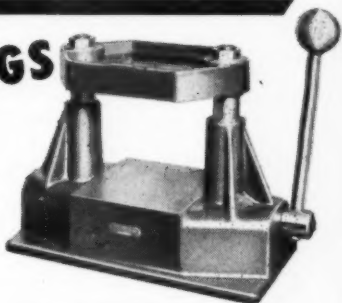
**ECONOMY
MACHINE PRODUCTS
COMPANY**

5212 Lawrence Ave., Chicago 30, Ill.

"Cone-Lok" JIGS

ACCURACY
YOU CAN TRUST

- MECHANICAL SIMPLICITY
- ADAPTABILITY
- RUGGED CONSTRUCTION
- CHIP PROTECTION
- SEALED LUBRICANT
- MAXIMUM SAFETY



The Woodworth "CONE-LOK" jig utilizes the full braking power of its perfectly mated male and female cones.

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WOODWORTH

N. A. WOODWORTH CO. • 1300 E. NINE MILE ROAD • DETROIT 20, MICHIGAN

NICHOLS TWIN MILLER ADJUSTABLE IN THREE PLANES

The W. H. Nichols Co., announces the new Nichols Twin Miller, a versatile double-spindle high-precision unit. It is said to be particularly valuable for light-duty work where two surfaces can be milled in a single pass. The machine has two opposed independent geared milling heads powered by pancake type motors; each has fifteen spindle speeds available from 55 to 2080 r.p.m.

Each milling head is adjustable in three planes: horizontally by means of slides and set screws; vertically; and transversely by feed screws with direct reading micrometer dials. The maximum height of spindle centerline above table is 12", minimum height, 1-1/2". The maximum distance between spindle noses across table is 16", the minimum distance, 4". Vertical attachments, which may be fitted to either spindle, provide even



wider flexibility. The 8 1/2" x 34" table is pneumatically powered by a solen-



You Need Only 1 DORMAN TAPPER

AUTOMATIC REVERSE

... instead of 3 ordinary tappers to tap
No. 2-56 to 3/8" in steel!

Plus Additional Advantages

1. No Collets to get lost or need replacement.
2. Floating Chuck Jaw and Adjustable Friction Drive to prevent tap breakage.
3. No Pressure required to operate, makes a perfect thread (class 4 fit) possible.
4. Compact, Light Weight Aluminum Housing, occupies absolute minimum for tap capacity.
5. Furnished with Quill Clamp for rigidity or M. Taper Shank for quick change.
6. Low Price—No. 1 Size Fri. dr. M. T. S. \$44.00.

2 LARGER SIZES — POSITIVE DRIVE

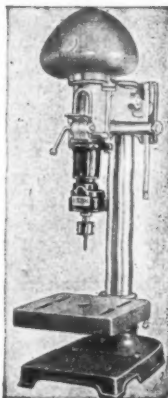
2-A Cap. 3/8" to 7/8" in Steel. 3-A Cap. 1/2" to 1 1/4" in Steel.

ROUND SPLIT • BUTTON • ACORN DIES

can be used in all sizes Dorman Tappers.

DIE HOLDING ASSEMBLIES IN STOCK

Write for Bulletin



DORMAN MACHINE TOOL WORKS 40 S. Mac Questen Parkway, Mount Vernon, N. Y.

oid-operated air cylinder and travels a maximum of 12", with a 9" hydraulically controlled cutting stroke. The machine requires 4' x 5' floor space and is 55" in height.

Construction is rugged yet extremely precise. Knees saddle, and table are heavy box section semi-steel castings. All finished surfaces are ground and hand scraped where necessary for a high degree of accuracy.

For complete information:

Nichols-Morris Co., Dept. BB
50 Church St.
New York 7, N. Y.

TAP CARTRIDGES OFFERED IN TOOL ROOM KIT

The Foulk Manufacturing Co., has taken over the manufacture of Tap Cartridges. These are small wax slugs which are placed in blind holes before tapping. When tapping, the Tap Cartridge is extruded up along the flutes of the tap carrying the chips out of the hole. In plastics, and in ferrous and non-ferrous materials its advantages are obvious.



CAPEWELL TECHNITE REDUCES CUTTING TIME . . .



TWO-THIRDS

In an effort to reduce the time spent on cutting Stainless Steel No. 410-8" billets, one prominent West Coast plant made sample cuts with Capewell's *Technite* hack saw blade. The result — a tough cutting job was accomplished in $\frac{1}{3}$ the time formerly required. Improved heat treating makes *Technite* cut faster . . . yet last longer. That is why more and more steel warehouses are relying on *Technite* to help them make deliveries on time. This blade can produce similar savings of time and money in your plant. Ask your distributor about Capewell *Technite*.

The **CAPEWELL**
1881
Manufacturing Co.

HARTFORD 2, CONN., U.S.A.

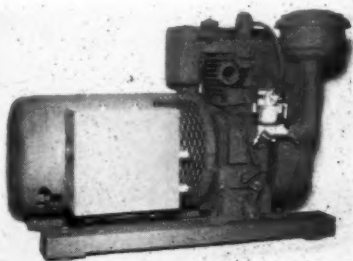
METAL WORKING CRAFTSMEN FOR OVER 65 YEARS

KATO 1000 WATT LIGHTING PLANT

The new 1000 watt Katolight is powered with a completely new engine. Although it has only a $2\frac{1}{2}$ " x $2\frac{1}{2}$ " bore and stroke, it develops 2.6 horsepower at 1800 r.p.m. The governor holds frequency within less than one cycle variation between partial load and full load. It is furnished with a built-in automatic choke, mechanically operated.

An improved carburetor permits lower fuel consumption. The ignition contact points are easily accessible; the breaker points are mounted outside of the crankcase along side of the carburetor. The fly wheel need not be removed in order to service the points.

Th plant is equipped with the Magnematic Ignition System; this includes improved spark at starting speed. Breaker points, condenser, radio shielded stop switch and ground wire are provided. Terminal is mounted in box on outside of crankcase, accessible for servicing. The spark advance on the cam shaft automatically retards the spark at starting speed and advances the spark as the engine speed increases.



The unit is available with gravity carburetor with one gallon fuel tank, or with mechanically operated fuel pump. Ignition system and spark plug are completely shielded. The plant is available with either remote control or for automatic control. It will produce a constant source of standard a.c. current, either for standby purpose or as a sole source of supply. For complete specifications, write:

Kato Engineering Co., Dept. BB
Mankato, Minn.



The
"American Way"

**MACHINES TO BEND COLD PIPE, CONDUIT, BOILER TUBING
AND SOLID BAR . . . BENDING TABLES ALSO AVAILABLE**



Above: Hand powered Type A-30 . . . up to 180 bends . . . all sizes from 1/4" to 2". Only 7 parts. World's fastest, simplest machine. Note assortment of bending dies . . . this process makes shorter tangents than any other. Occupies only 18" by 18" floor space!

Other Sizes Available

Factory and Main Office:

14 Furnace Street Poultney, Vermont

RADIANT HEAT BENDS

For residential work—at 6" and 9" radius bends on 1/2" and 3/4" pipe.

For industrial sizes — at 6" and 9" radius bends on 1" and 1 1/4" pipe.

All the above bends and sizes are specified and accepted by most heating engineers and contractors.

Furnished as extras if required on our Type A-30.

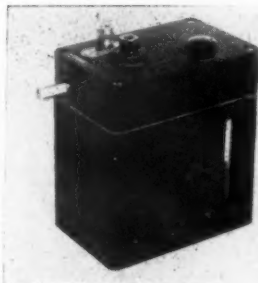
"American"
PIPE BENDING MACHINE
Company INC.

AUTOMATIC LUBRICATOR FOR SMALL MACHINES

Designed for installation within small machines, the type "M" lubricator can oil up to 100 bearings with measured regularity. Automatically driven by the machine, this cyclic unit develops an average discharge pressure of 40 pounds p.s.i., and discharges from 2.5 to 5.5 c.c. (adjustable) at each pump impulse. Used in conjunction with a meter-unit distribution system, the type "M" unit delivers small quantities of oil under accurate control to all bearings, gears and way surfaces of a machine at pre-determined intervals.

The lubricator is driven from a rotating machine shaft, either directly or by means of a belt or gear drive of correct ratio. Power requirements are only .001 h.p. The lubricator is available in several reduction ratios, permitting the selection of the correct rates to accommodate the drive speed and the lubricator cycle time desired, and in both right and left-hand drives.

The device is a two-part mechanism, consisting of a lubricator unit mounted directly on a reservoir. The mechanical unit consists of a cover supporting the



drive shaft, reduction gear mechanism and pump. The metering pump is of the piston type and is actuated by a cam driven through a series of gears. For complete data, write:

Bijur Lubricating Corp., Dept. BB
43-01 Twenty-Second St.
Long Island City 1, N. Y.

BLISS WELDING PRESS PERFORMS IN ONE-STEP OPERATION

High speed assembly of large metal sections is possible on a welding press recently developed by the E. W. Bliss Co. Complicated assemblies which formerly required separate operations are performed automatically in one step. At present, these presses are being used by an automotive manufacturer for assembling chassis, dashboards, body panels and similar units.

The parts to be assembled are placed in position on the lower die, or pre-loaded on conveyors, after which the press cycle is completed automatically. The lower die is raised until it touches the upper die, which contains welding tips placed in positions corresponding to the spots to be welded on the metal section. Limit switches stop the slide in the correct position, perform the welds, and return the slide to the lowered position when all the welds are completed. The spot welding is done electrically, and any number of welds can be made at once.

The new welding press is available



in two models; For use in shops with limited headroom, the 4LU series is designed with the driving unit in the base; where headroom is no object,



Kutmore
HIGH SPEED
ADJUSTABLE
HOLLOW MILLS

Designed for modern production requirements. Saves time, effort and motion. Has a two way micrometer adjustment with locking device to assure absolute cutting accuracy.

Kutmore Hollow-Mills may be had with straight or taper shanks, high speed or Carbide Tipped blades. Insist on Kutmore for accuracy, speed and economy. Prompt delivery. Write for Catalog No. 15.

Carl Wirth & Son
1625 CLINTON AVE. N.
ROCHESTER 5, N. Y.

the 4L series (illustrated) has the driving mechanism in a more accessible position on top of the press. The 4L series also permits a change stroke from 12 to 16" without change of parts.

Dimensions:

Size of bed (die space)	72" x 38"
Shut Height	44"
Stroke	12" and 16"
Floor Space	120" x 50"
Overall height	126"
Strokes per minute	20-40

Additional information can be obtained by writing to:

E. W. Bliss Co., Dept. BB
450 Amsterdam Ave.
Detroit 2, Mich.

In both series, the lower die moves up to meet the stationary upper die, and is supported at four points to assure accurate positioning.

4L

4LU (underdrive)

69" x 29"
30"
14"
82" x 45"
94"
20-60

**DIAMOND COMPOUNDS
FOR LAPPING AND POLISHING DIES**

Lapping and polishing of forging and heading dies is becoming increasingly important to lengthening die life and improving die performance. Hyprez Diamond Compounds which remove scratches, nicks and pits, and give a mirror finish, are recommended.

Polishing is of particular importance when forging aluminum or magnesium;

areas in which the greatest deformation takes place should be polished more thoroughly. It has recently been shown that improvement can be effected when forging brass and bronze and even steel, as Hyprez polish is lasting and metallurgically correct to give maximum life to the die surface.

Hyprez Diamond Compounds are supplied in eight different grades of dia-

NIAGARA Aero Cooling Pays for Itself!

Saves Cooling Water, Increases Capacity, Saves Operating Costs

NIAGARA Aero HEAT EXCHANGER

Cools fluids to within 10° of atmospheric wet bulb temperature; holds to tolerances of 2°F.

Heat treaters increase production, improve quality, decrease rejections by controlling quenching bath temperatures with NIAGARA Aero Heat Exchanger.

Also used in liquid cooling in industrial and chemical processes, water jacket cooling, hydraulic fluid, transformer oil, lubricating and cutting oil cooling, vapor and steam condensing.

NIAGARA Aero AFTER-COOLER

Furnishes drier compressed air . . . eliminates half the moisture allowed by conventional after-cooling methods. Protects your air tools.

NIAGARA BLOWER COMPANY

*Over 30 Years of Service in
Industrial Air Engineering*

Dept. MT-68 405 Lexington Ave., New York 17, N. Y.

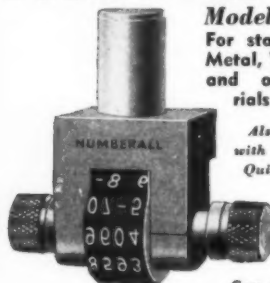
Field Engineering Offices in Principal Cities



2 WHEELS—Quick Change

Model No. 85

For stamping into
Metal, Wood, Fiber
and other mate-
rials.

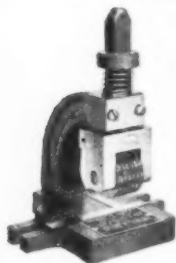


Also supplied
with ALL Wheels
Quick Change

Can be furnished
with any number
of wheels up to 20. With Two Wheels, the
"Unit Wheel" and the "Tens Wheel" can be
turned by using the two outside knobs to
quickly set the required number. This greatly
facilitates consecutive numbering.

BULLETIN BB-85

NUMBERING MACHINE PLATFORM 45



For stamping fixtures,
letters and fractions
with uniformity and
speed into brass, alu-
minum, zinc, unhardened
steel, iron, etc. This

method is faster than stamping with hand
stamps, mono-wheel presses or type. Platform
furnished with adjustable guide and thumb
screw adjustment, enabling operator to locate
the plates or tags with precision and speed.
Stamp can be taken out of holder for stamping
larger objects. Characters always properly
aligned; of uniform depth.

BULLETIN BB-45

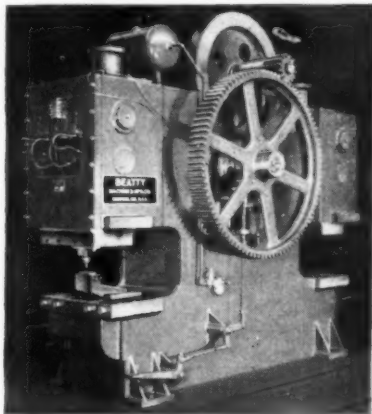
NUMBERALL STAMP & TOOL CO.
HUGUENOT PARK STATEN ISLAND 12, N. Y.

mond powder with up to four different
diamond concentrations. The abrasive
content consists exclusively of clean,
accurately graded diamond powders,
uniformly distributed and permanently
suspended in a patented stable com-
pound. For complete details on the ap-
plication of this compound, write to:

Engis Equipment Co., Hyprez Div.
431 S. Dearborn St., Dept. BB
Chicago 5, Ill.

NEW BEATTY DOUBLE END PUNCH

A new design principle is incorpo-
rated in the Model No. 9, Double End
Punch, developed by the Beatty Ma-
chine & Manufacturing Co. The rede-
signed unit, in addition to shortening
the distance from punching centers
from 12 down to 9 feet, employs welded
steel instead of cast construction.



The shortened machine is more rigid,
occupies less floor space, and fits pro-
duction line requirements. Featured
are centralized lubrication and air
counterbalance of the ram. The ma-
chine is provided with a 24" throat at
each end. It is equipped with an archi-
tectural table with a front filler block
to convert to plain table.

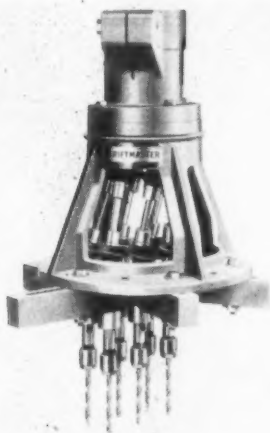
The new unit has created interest

among structural fabrication shops, implement manufacturers, and similar plants. For complete details, write:

**Beatty Machine & Mfg. Co., Dept. BB
Hammond, Ind.**

NEW ADJUSTABLE DRILL HEAD HAS $\frac{1}{4}$ " CAPACITY

A new universal joint drive multiple spindle drillhead has been brought out by Thriftmaster Products Corp. The new device is full ball bearing mounted, and features flexibility of operation and strong construction. The drillhead has a high overload capacity, made for use with power feed, and is rated at full capacity of $\frac{1}{4}$ " drills in steel.



The gears and spindles are fabricated of special alloy, test-hardened steel. It is furnished with 2-6 spindles, minimum $1\frac{1}{8}$ " center spacing, within a $6\frac{1}{4}$ " diameter circle. It is made for right-hand rotation of the drill press. Literature is available upon request to:

**Thriftmaster Products Corp., Dept. BB
1048 N. Plum St.
Lancaster, Pa.**

IT OFFSETS HIGH WAGES

You will eliminate from your payroll many hours of highly-paid Machinists' time if you have these men use the JACKSON TIME-SAVING VISE. It cuts out the time they are forced to waste hunting for Bolts, Clamps, Angle Plates, Parallel Strips, etc., when "rigging up" work on the Drill Press, Miller, etc. Furthermore, you can eliminate the simultaneous loss of output and overhead expense incidental to having your productive machine idle during the "rigging up" process. The four-side turret jaw and supplementary jaws enable the Vise to hold quickly THE THOUSAND AND ONE SHAPES that arise annually in Machine Shop work. SEND FOR BULLETIN No. 23-B.



BROWN ENGINEERING CO.

126 N. THIRD ST. READING, PA.

VISES • CLUTCHES • COUPLINGS

make blade selection



a cinch

not a search

use

the

new

VICTOR WALL CHART

You'll see the name of the blade you want to use — hand, power or band saw — opposite the type of material you want to cut. You'll see this valuable information quickly, easily, when you tack the new Victor wall chart over your tool crib or in your machine shop.

What's more you'll get a lot of inside tips on how to get longer life, the best use, from every blade... There are plenty of ways to cut costs, make money, on this new Victor Wall Chart... It's printed clearly, attractively, and it's yours absolutely FREE.

Drop in on your Victor supplier — or send him a card today. *The supply is limited.* Also see him the next time you want the finest in cutting performance. He carries a full line of Victor blades — one for every job a hack saw or a band saw can do. Victor blades cut better, too, on metals, plastics, and other non-metals... cut faster, cleaner, last longer.



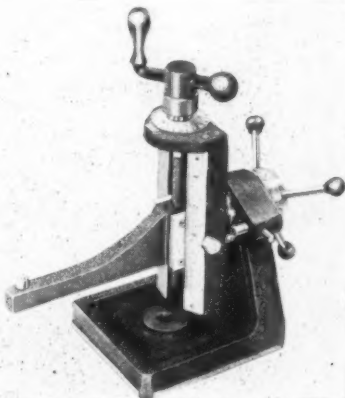
SAW WORKS, INC.
MIDDLETOWN, N. Y., U. S. A.

3708

NEW RADIUS DRESSER STRESSES HIGH PRECISION

A direct reading radius dresser, operating with the precision and simplicity of a micrometer, was recently introduced by Perfex Gage and Tool Co.

This diamond wheel-dresser features a ground micrometer screw that permits accurate setting throughout the tool's full range, from 2" convex to 2" concave radii. It is possible to dress a concave radius smaller than .050" full 180°, according to the manufacturers. The scale is in position for direct reading by the operator, and fast setting is obtained by adjustment of the micrometer screw, each revolution moving the diamond .025". The dressing head is graduated each 5° and is equipped with stop dogs that permit dressing a given arc. A master setting block is furnished, eliminating use of height gage or micrometer.



The instrument comes in a durable carrying case, with space for standard diamond tool and attachment for dressing small concave radii. For complete information, write:

Perfex Gage and Tool Co., Dept. Y
124 Avery St.
Mt. Clemens, Mich.

**Micro
Supreme**

**LAY-OUT AND
IDENTIFICATION DYE**



12 COLORS*

For Tool, Die, Pattern or Template layout on metal... Quick identification of stock and parts... Shows up in sharp relief—dries instantly—easily removed... Write for circular.

**Purple shipped unless otherwise specified.*

**MICHIGAN CHROME &
CHEMICAL COMPANY**
6340 E. Jefferson Ave. • Detroit 7, Mich.

**New Britain
UNIVERSAL VISE**

THE ORIGINAL

Swivels 360 degrees horizontally,
100 degrees vertically, to
give any angle or com-
pound of
angles.

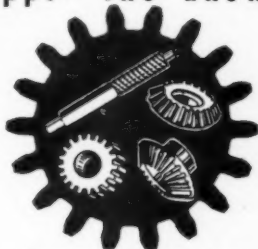


Write for
Further
Information.

NEW BRITAIN TOOL & MFG. CO.
NEW BRITAIN, CONN., U. S. A.

Have you a gear problem?

Let *Abart*
supply the answer



Long specialized gear experience, and every facility for most modern precision cutting. No stocks. Every ABART job a special job. Send samples or B/P for prompt estimate, any quantity.

ABART GEAR & MACHINE CO.

4832 W. 16th St., Chicago 50, Ill.

Also Abart Speed Reducers. Ask for catalog

Recondition Old Saws



With the **HOWE LINDSEY
AUTOMATIC
SAW SHARPENER**

- HACK SAWS
- BAND SAWS
- CIRCULAR SAWS
- MEAT SAWS

HOWE AND SON Inc.
HINSDALE N. H.

Your **MOTOR BECOMES**
a POWER TOOL
 with the
STOW
FLEXIBLE TOOL SHAFT



Your spare or idle motor—electric or gas—becomes a versatile productive power hand tool with the addition of a STOW Flexible Tool Shaft. This handy STOW unit connects instantly to your motor shaft, delivers full power to the easy-maneuvered working end. Interchangeable wheel-arbor or chuck attachment on the ball-bearing hand-piece gives wide range of uses such as: *Grinding, buffing, sanding, polishing, drilling, routing, scouring and end-brushing.* This is the original and genuine STOW Flexible Shaft. Rugged, heat-treated core, $\frac{3}{8}$ "-diameter, works in a casing with spiral spring steel liner covered with a durable, oil-resistant casing. Comes in two lengths.

Five-footer sells at
\$18.50
 Six-foot length at
\$19.75

At your hardware or mill supply store, or write directly to:

STOW **MANUFACTURING**
COMPANY
 30 Shear St., Binghamton, N. Y.

BEARINGS FEATURE LESS WEIGHT AND SPACE

Savings in space and weight without sacrifice of load bearing strength are design features of the XLS bearing series being manufactured by The Federal Bearings Co. Light and compact with uninterrupted deep groove races, they are capable of taking substantial thrust loads in either direction, as well as heavy radial loads. The XLS series is produced in sizes from $1\frac{1}{8}$ " to 10" bores with outside diameters from 2-9/16" to 13 $\frac{1}{4}$ ".

These bearings may find application in compact clutches; in thin-walled housings; for large diameter shafts where the load is such that extremely high carrying capacity is not required of the bearing; in instrument design and wherever limited space is available for bearing installation, and wherever weight saving is important.



Federal XLS bearings are fabricated throughout from SAE 52100 steel with close controls maintained throughout the entire hardening, quenching and drawing cycle. Careful grinding operations assure accurate finished dimensions and provide for smooth operation and precision performance. For further information, write:

The Federal Bearings Co., Inc.
Dept. BB
Poughkeepsie, N. Y.

• **PORTABLE
ELEVATING TABLE**



**Saves
TIME
and
LABOR**

- Eliminate heavy lifting and cut handling costs. Slight foot pressure varies height up to 15½", leaving operator's hands free. Table swivels and locks in any position.

- SEND TODAY FOR ILLUSTRATED CATALOG NO. 2

- **MIDWEST TOOL & ENG. CO.**
112 WEBSTER ST., DAYTON, OHIO

CUTTERS



Hand Power for Lever Action
RODS FLAT BARS ANGLES
WIRE ROPE

Send for circular.

T. H. LEWTHWAITE MACHINE CO.
312 East 47th St., New York 17, N. Y.

OPTICS FOR GRINDING

Check

**YOUR CARBIDE
TOOL ANGLES**
with



OPTI-CHECK

- Magnifies Tool
- Magnifies Reading
- No Fussy Juggling
- Accuracy ¼ Degree • Makes Duplication of Sharpening Angles Easy.
- Checks Drills, Cutters, etc.

Write

THE BENTON CO.

DEPT. H 351 S. LA BREA, LOS ANGELES, CALIF

NIELSEN

Heavy Duty

*Live
Centers*

*Write for
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live centers*

Adapted
for heavy
duty work.
Precision type
ball and roller
bearings assure
maximum capacity
for high speed
production and long
service.



NIELSEN, INC.

**LAWTON,
MICH.**

• OUR POLICY

is
to sell only
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"Re-set-able" Diamond
Dresser Tools
as our capacity
for
Resetting Service
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*We now service
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New Diamonds — 3 Grades

\$12.00 per Karat

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Sizes 1 to 10 Karat

Lock-Key-Set Re-set-able



DIAMOND TOOL CO., Not Inc.
938 E. 41st Street CHICAGO, ILL.

Sheldon M. Booth, Pres.

Phones: AT 5-1094, 1095

COMPACT VERTICAL MILLING MACHINE HAS 1/2" CAPACITY

A new vertical milling machine, the "No. 1 Dodge Vertical", has recently been announced by the Allied Machinery Co. The manufacturers stress this machine's accessibility and maneuverability. It occupies a space of only 18" x 15". The miller is of high sensitivity, and extremely accurate in its control.

The milling table measures 15" x 4 1/4", and contains two tee-slots. It has a longitudinal feed of 9" and a cross feed of 4 3/8". The vertical feed of the knee of the No. 1 Dodge Vertical is 6 3/4". The unit is powered by a 1/3 h.p. single phase, 1750 r.p.m. motor. It is equipped with four spindle speeds — 490, 978, 1750, and 3020 r.p.m.



The maximum distance from the spindle to the table is 8". From the spindle to the depth of the throat is also 8". The machine is provided with a swivel graduated head. The collet capacity is 1/2". Independent locks are included for both spindle and table.

For complete specifications and descriptive literature on this versatile new unit, write:

Allied Machinery Co., Dept. BB
548 W. Monroe St.
Chicago, Illinois.



DOWEL PINS



Immediate Delivery!

Standard Size Dowel Pins from $\frac{1}{8}$ " to 1" diameter and from $\frac{3}{8}$ " to 6" length supplied in .0002 and .001 over basic sizes. Unless otherwise specified, .0002 oversize will be furnished.

SCHULTZ & ANDERSON CO.

109 Edison Place, Newark 5, N. J.



*It's dangerous to cut
Keyways under pressure
with an exposed,
unprotected blade.*

Cut KEYWAYS Safely
with **The GLENNY
PUSH BROACH**

Adjustable
Expansion

Safe from rejects thru error—the Glenny assures maintained accuracy on all work.

Safe from rejects due to scoring of the bore.

Safe from blade breakage because sleeve of broach protects blade when tool is under pressure.

Safe for operator—sleeve acts as guard—unprotected, unsupported blades become a hazard to face and body of operator when cutting pressure is applied.

NOW—NEW GLENNY BUSHINGS ADAPT
STANDARD GLENNY BROACHES TO MANY
NEW TIME AND MONEY SAVING OPERATIONS

DEPT.
10

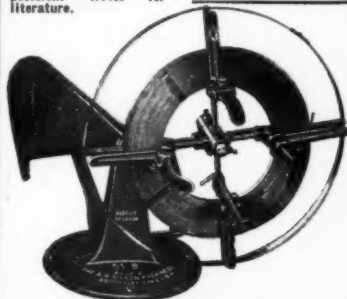
**The EAST SHORE
MACHINE PRODUCTS CO.**

825 EAST 140th STREET • CLEVELAND 10, OHIO

NILSON

WIRE AND RIBBON STOCK REELS *

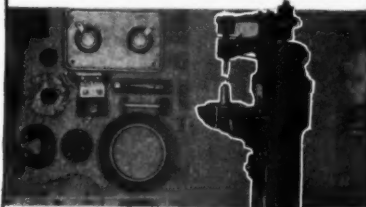
Reel is loaded by one man in less than one minute. . . . Automatic balancer eliminates hand lifting . . . avoids strains and accidents. Locking device automatically locks reel in position. Write for literature.



THE A. H. NILSON MACHINE CO.

BRIDGEPORT, CONN., U. S. A.

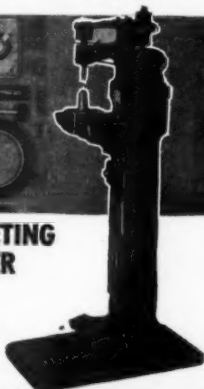
INCREASE YOUR PROFITS WITH A HIGH SPEED



COLD RIVETING HAMMER

GET A FREE
ANALYSIS OF
YOUR RIVETING
PROBLEM...

WRITE TODAY!



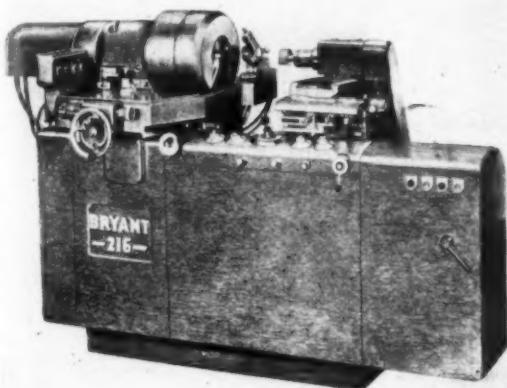
The High Speed Hammer Co., Inc.

311 Norton St.

Rochester 5, N. Y.

NEW BRYANT HYDRAULIC INTERNAL GRINDER

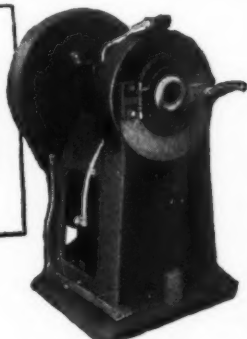
The No. 216 Bryant Grinder is provided with a 16" swing inside the standard water guard and with a 15" total wheel slide traverse. (Swing is limited to 12" when grinding tapers greater than 15° included angle.) It is generally suited for grinding work with bores up to 8" diameter, and the grinding traverse permits grinding of 6" bore lengths. For the smaller ranges of bores, Bryant High Frequency wheel spindles operating up to 100,000 r.p.m. may be used. A variety of standard or special tooling may be used in conjunction with the machine to satisfy the particular needs of the customer.



The cross feed is obtained by lateral motion of the work table which is supported by specially designed roller

"Standard" SWAGING MACHINES SHAPE AND JOIN METALS Without Cutting

• In one rapid operation "Standard" Swaging Machines reduce, point, and form tubing or bar stock — without loss of material. They also attach fittings to tubing, wire or cable. Parts swaged are smooth, strong and accurately sized. "Standard" Swagers have many special features for durability and fast, easy operation.



16MM SOUND FILM, 26 minutes, showing principal and applications of Swaging, offered engineering and production groups. Write for available dates.

STANDARD MACHINERY COMPANY

1555 ELMWOOD AVENUE • PROVIDENCE 7, RHODE ISLAND

Manufacturers of

Power Presses to 500 Tons • Rolling Mills • Swagers • Turbines • Steel Die Sets

bearings. The various movements of the machine are hydraulically operated to afford flexibility of operation between the various units. Cycle control is accomplished electrically so that the cycle can be changed to suit varying working requirements.

Three methods of automatic sizing are provided. The basic machine is equipped so that change-over from one method to either of the others can be accomplished merely by the addition of the sizing equipment. For taper grinding, the wheelhead is swung about a center directly under the chuck. Tapers can be ground up to 60° included angle. For complete details, write:

Bryant Chucking Grinder Co.
Dept. BB
Springfield, Vermont.

BETTER BEARING MASTER PUSHER

A new padded Pusher having an extremely long bearing surface, with external threads ground from solid stock to assure concentricity, is announced by the Sheffer Collet Co. The Tool is identified as "Sheffer Better Bearing Master Pusher". The pads can be quickly changed to handle stock of various sizes without the need of special tools. A choice of pad material makes this Pusher useful either on high production jobs, or on the finest polished stock. The same shell and nipple can be fitted with pads of hardened steel,



hardened steel with bearing lapped and chrome plated, cast iron, or bronze. Tension can be readily adjusted. For complete information:

Sheffer Collet Co., Dept. BB
Traverse City, Mich.

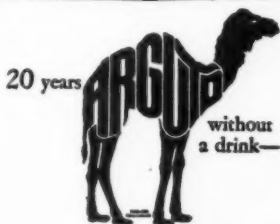
ARGUTO
OILLESS BEARINGS

USED

ALL OVER THE WORLD

... IN MANY DIFFERENT
APPLICATIONS

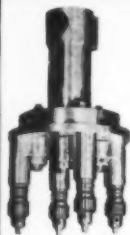
**"OUTWEARS THE BEST
BRONZE METAL"**



ARGUTO OILLESS BEARING CO.

WAYNE, MICHIGAN

DELLAVALLE, CALIF.



SELLEW (CLUSTER ADJUSTABLE) FULL BALL BEARING DRILL HEAD

This type of adjustable head can drill holes in circular, straight line or staggered formation. The minimum circle obtainable with this No. 1 AC size is 2", maximum circle obtainable 7". When head is furnished with drill chucks, largest size drill, 1/4", when furnished with taper holes in the spindles, largest drill is 9/16".

Heads of this type are made in larger sizes with No. 2 and No. 3 M.T. Holes in the spindles.

We also design and build special drill heads, and drilling machines to customer's specifications.

Sellew Machine Tool Co. (Inc. 1910) Pawtucket, R. I.

GAIRING IMPROVED E-CON-O-MILL CUTTER

Several improvements are announced by the Gairing Tool Co. in their E-Con-O-Mill, a recently developed standard face mill. Carbide tips on the square tool bit type blades have been increased from 3/8" to 5/8" in width, extending the full width of the blade, 3/4" back from the cutting edge.

The blades, furnished with all clearance angles finish ground, are now protected by a plastic coating, and are individually cartoned. Three types of blades are available for cutting various metals. For easier identification, each blade is now clearly branded, each type designated by a different color.

As additional equipment, an assembly fixture is now available which accommodates all sizes of cutters, making assembly of blades into the cutter bodies a faster and more accurate operation. For complete details on the E-Con-O-Mill Cutter, write:



**The Gairing Tool Co., Dept. BB
Roosevelt Park Box 478
Detroit 32, Mich.**

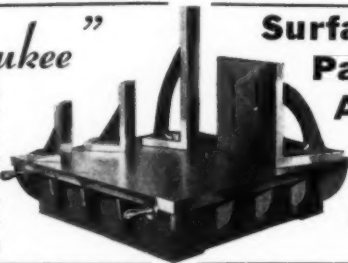
PRODUCTION AND TOOL ROOM HONING MACHINE

A new model Honing Machine, designated as Model B-3, has been added to its line of honing tools by the Staple Engineering Co. This unit will hone parts having inside diameters ranging from 1/4" to 4". A machined surface is

provided upon which work holding fixtures may be mounted. For production work, the parts are held in a fixture. Stroking action is manual, as is usually the case in tool room work when honing small lots.

"Milwaukee"

Your measuring needs are accurately met with Milwaukee precision tools. They are made in various type surfaces and a variety of sizes. Write for your catalog today!



Surface Plates Parallels Angles

**J. C. BUSCH CO.
165 S. BARCLAY
MILWAUKEE 4, WIS.**

"Since 1907"

You NEED these TWO Machines



- The MILWAUKEE DIE FILER for straight-line, sharp-corner filing, sawing and lapping.
- The MILWAUKEE PROFILE GRINDER for high speed, precision grinding of curved and irregular contours.

RICE PUMP & MACHINE CO.

Division of Milwaukee Chaplet & Mfg. Co.
1027 S. 40th ST. MILWAUKEE 4, WIS.



Write for
Bulletins

MILWAUKEE DIE FILERS PROFILE GRINDERS

The spindle drive is by means of a $\frac{1}{2}$ h.p. motor through a variable speed drive. When using a 1200 r.p.m. motor, spindle speeds are variable from 300 to



980 r.p.m.; with a 1750 r.p.m. motor, spindle speeds range from 490 to 1480 r.p.m. For complete specifications and technical data on the Model B-3, write:
Staple Engineering Co., Dept. BB
1315 S. Woodward Ave.
Birmingham, Mich.

DOUBLE-BALL HANDLE THUMB SCREW

To answer the demand for an improved handle screw that will afford greater leverage, the Ohio Nut & Bolt Co. has recently brought out a Double-ball Handle Screw. In the production of this screw on modern press-type projection welding machines, the manu-

facturer is utilizing the most advanced practice in electronic controls. This makes possible a welded joint of greater strength than the metal in either of the parts that are welded together.

These screws will be available in No. 8, No. 10, $\frac{1}{4}$ ", $\frac{5}{16}$ " and $\frac{3}{8}$ " thread diameters, and with ball handles 3" across or longer. The materials will be low carbon steel or stainless steel.

The Ohio Nut & Bolt Co., Dept. BB
600 Front Street
Berea, Ohio

HANDISHEAR

The Sensational New Dual Purpose Threadless Shear . . .

Cuts circle from within . . . Universal Application . . . For Intricate, Angular, Radii or straight Cuts . . . Used Mounted on Base or Portable . . . Pattern Always in Full View . . . Safe—Both Hands Above Work . . . Shears Metal Without Distortion . . . The Blades in Your Shear Are Made of the Toughest Chrome Carbon Quality Steel. . . Write today and get full details!

Cap. 14 ga.
Mild Steel,
18 ga.
Stainless.



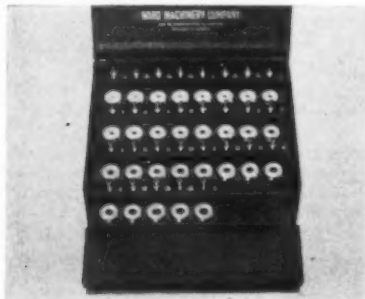
**MECHANICAL
SERVICE
& MFG. CO.**

7139 S. Racine Ave.

Chicago 36, Ill.

PUNCH & DIE CABINET SAVES TIME

A new time-saving Punch and Die Cabinet has been announced by the Ward Machinery Co. The Punch and Die Cabinet, No. 32, contains 64 punch and die compartments and 29 sets of



ground, round punches and dies, from 1/16" up to and including 1/2" in 1/64" graduations. Kit No. 56 contains 112 punch and die compartments and 56

sets of round drill size punches and dies, No. 1 to and including No. 56. Punches of either Kit No. 32 or No. 56 fit any type of punch press using Ward standard punch and die adaptors.

Lost time while hunting for the correct punch and die set is eliminated, because each punch and die has its place in the easily accessible kit.

Punch and die adaptors and die shoes can be furnished at extra charge for any type of foot or power operated press. Kits are available immediately from stock. Write:

Ward Machinery Co., Dept. BB
546 W. Washington St.
Chicago 6, Ill.

MILLERS & PUNCH PRESSES

Specifications, photos and descriptions. Discusses determination for calculation of press capacity. Attachments and accessories. 8 pages.

Diamond Machine Tool Co., Dept. BB, 3429 E. Olympic Blvd., Los Angeles 23, Calif.

Maximum Production . . . in Chucking and Indexing



With the new **Dearborn Automatic Indexer** connected to a Dearborn Chucking Fixture: chuck is closed **automatically**; indexed the required number of times **automatically**; chuck is opened **automatically**; piece is knocked out **automatically**.

When used with the Dearborn Degree Indexing Fixture it can quickly be set to index any number of degrees from 30° to 90° at one indexing and then knock out, or it can be set to index from no degrees to 90° and then not knock out.

WRITE FOR FURTHER INFORMATION

J. W. DEARBORN

ANSONIA, CONN.

Producers of Screw Machine Products to Specifications

ONE, FOUR and SIX spindle automatics maximum capacity 2½" round. Hand Screw Machines and Universal Turret Lathes maximum capacity 3" round. Castings and Forgings machined maximum 10" diameter, 8" length, 15 pound weight. Secondary operation equipment for milling, drilling, tapping and assembling. Fabricators of aluminum, brass, steel and their alloys.

SCREW MACHINE SPECIALTY CO.

5600 Butler St., Pittsburgh 1, Pa.

STERLING DRILL GRINDER



CAPACITY:

¾" to 2½" drills.
5" x 9" adjustable table.

MOTOR: ½ hp,
3450 rpm.

NET WT: 250 lbs.

CRATED: 320 lbs.

McDONOUGH MANUFACTURING CO.

EAU CLAIRE, WISCONSIN, U. S. A.

Uniform Accuracy

This dominant factor for extra savings in assembly time and cost is a part of every piece that makes up the complete line of Screw Machine Products



SET SCREWS
CAP SCREWS
COUPLING
BOLTS
MILLED STUDS
in all
sizes and
threads

PRECISION MILLED by

WILLIAM H. CO.
Ottomiller
York, Pennsylvania

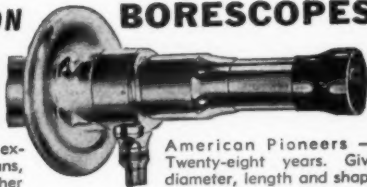
ILLUMINATED INSPECTION



"Lenox Detects Hidden Defects" while exploring the dark holes of industry — guns, hollow shafts — Refinery, well drill and other tubing, irregular dark spaces.

LENOX INSTRUMENT COMPANY

BORESCOPIES



American Pioneers — Twenty-eight years. Give diameter, length and shape of cavity.

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PHILADELPHIA 3, PA.

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PRESENTS



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STOCK GEAR
NO. 63 CATALOG**

**IT'S FULL OF ESSENTIAL
GEARING INFORMATION**

**SEND FOR FREE
YOUR**

COPY TODAY

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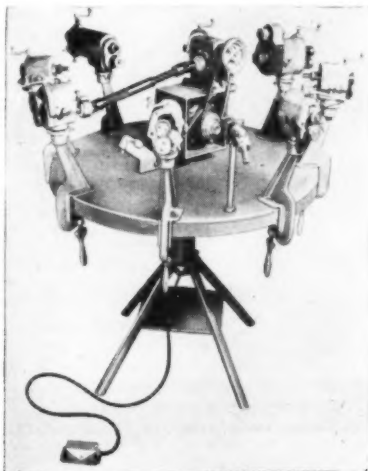
COMPANY

**617-623 Arch St.
Philadelphia 6, Pa.**

**TABLE PROVIDES POWER FOR
HAND-CRANKED TOOLS**

Designed and developed to provide central power for a variety of hand-cranked tools and machines, the Roto-Table is a product of Roto-Table Co.

Forty-two inches in diameter, the table rotates around a central shaft to which is attached an electrical motor-driven gearbox. A spring-loaded arm having universal joints and sockets at each end, connects the drive unit with machines mounted around the rim of the table. Three ranges are provided through Vee-belts, and a foot switch controls both forward and reverse motion.



Two seconds is the time required to connect or disconnect the power arm from drive unit or any of the driven tools and machines. The table rotates to permit powering of a number of devices in any production sequence. The circular table provides working space equivalent to a 24" x 27" stationary table.

**Roto-Table Co., Dept. BB
2605 E. Third St.
Dayton 3, Ohio.**

CLIMATE-PROOF ALL-METAL SLIDE RULE

Plastic-covered magnesium alloy replaces wood in the Ortho-Phase Log Log Slide Rule. This material affords several advantages: enduring accuracy under extreme weather conditions, through the use of non-warping, all-metal construction; precision manufacture is to .001" tolerance. The cursor window is kept away from the scale surface by cursor "centering groove" and spring channel. Precision-made adjusting screws afford accurate line-up of the scales on the body and the slider. An optical groove centers the slider

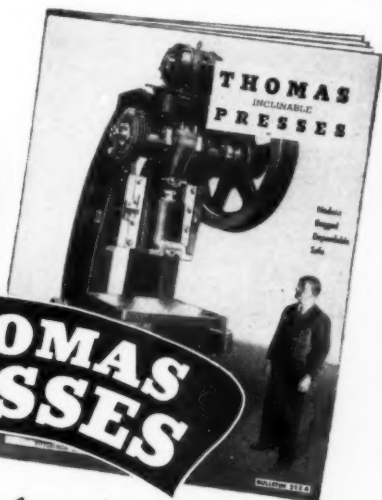
and makes hair-line settings easy. The rule does not stick, bind, or wobble. Non-fading scales are unaffected by grease, oil, or repeated cleaning.

The Ortho-Phase Log Log rule bears standard Log Log scales; it measures $12\frac{1}{8}" \times 1\frac{1}{2}" \times 1/8"$; it comes complete in a cardboard box with carrying case and illustrated instruction manual. For complete data, write:

Pickett & Eckel, Inc., Dept. BB
1111 S. Fremont Ave.
Alhambra, Calif.

Send for this
NEW BULLETIN

on **THOMAS
PRESSES**



In this new Bulletin you'll find specifications and illustrations of the complete Thomas line of Open Back Inclinable and Horn Type Presses. Ask for Bulletin 212-A.

*Available for
Reasonable Deliveries*

On 56, 80 and 106 Ton Capacities

THOMAS

MACHINE MANUFACTURING COMPANY

PITTSBURGH, 23, PA.

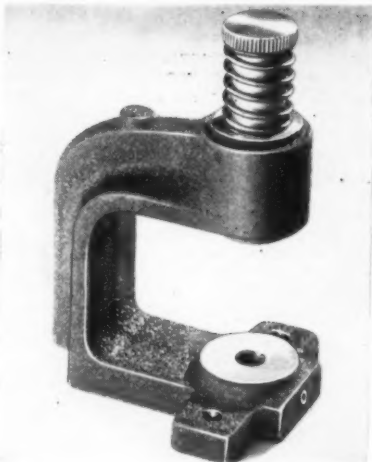
P-6

SUB-PRESS FOR USE WITH KICK, ARBOR, AIR, OR PUNCH PRESSES

Paragon Metal Products has recently announced a new self-aligning Sub-Press to serve as an auxiliary unit with kick, arbor, air, or punch presses. The new unit is said to increase the productive capacity of every type of press by eliminating the need for complicated and time-consuming set-ups for piercing, bending, forming, and assembling operations on small piece parts. Each operation can be tooled in a few seconds, and the set-up left permanently in the Sub-Press. When a change in operation is desired, the Sub-Press with the required set-up is put in place on the power or hand press bolster, and the production run may be resumed in a matter of seconds.

Perfect alignment, regardless of the inaccuracies in moving parts of the main unit, is claimed, because the ram and the die holes are line bored to precise tolerances. This feature helps to eliminate tool breakage due to misalignments and inaccuracies of large presses.

All flat surfaces are precision ground;



Adjustable MULTI-DRILL for Production Drilling

5" DRILLING AREA

AVAILABLE WITH 2 TO 8 SPINDLES

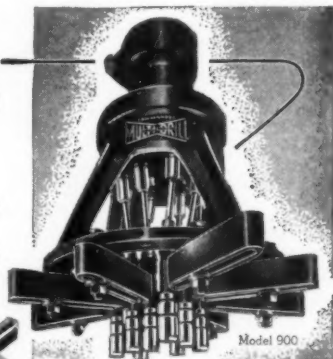
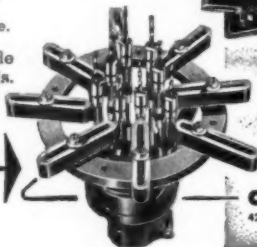
- Designed for accurate, high speed production drilling
- RUGGED CONSTRUCTION
- Quick, easy adjustments to **any** hole pattern on or within a 9" circle; $\frac{1}{2}$ " minimum center distances; Drill sizes $\frac{1}{16}$ " to $\frac{3}{8}$ "
- Special adaptations available.

MULTI-DRILLS are made in other sizes and models.

Write for details and name of your Distributor.

Locator arms are designed for fast, easy adjustment

Dependable Performance...
proven by industry



Model 900

FITS ANY DRILL PRESS

COMMANDER MFG. CO.

4227 W. KINZIE STREET, CHICAGO 24, ILLINOIS

the ram which moves in an Oilite bearing, is ground and polished. For complete operational and construction details, write:

Paragon Metal Products, Dept. BB
844 W. Adams St.
Chicago 7, Ill.

BUCKEYE STREAM-POWER PNEUMATIC TOOLS

A newly designed group of pneumatic tools called the Stream-Power line is introduced by Buckeye Tools Corp. The line comprises the following basic tools, with several models in each classification:

Stream-Power horizontal grinders, which range in speed from 3000 to 22,000 r.p.m., weighing from 1 to 12 lbs., with capacities from 1/2" to 8" diameter. Streamlining makes each model more compact, lightweight and quieter in



operation. The model illustrated (Fogger) has 8" capacity, delivers 4500 r.p.m., weighs 12 lbs.

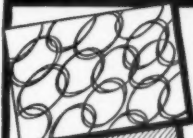
Stream-Power vertical grinders and sanders, in speeds from 3000 to 6000 r.p.m., weigh from 10 to 12 lbs; grinding wheel capacities from 4" to 6" diameter; sanding pad capacities from 5" to 9" diameter.

Other units in this new line include Stream-Power shears, nibblers, air wrenches, reversible drills and screwdrivers. Features include compactness, improved balance, quiet operation, less operator fatigue, increased power, direct air flow and ease of lubrication.

For complete information including individual construction features and materials, write:

Buckeye Tools Corp., Dept. BB
Dayton 1, Ohio.

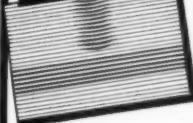
THE *Only* ELECTRIC SANDER WITH STRAIGHT-LINE "HAND SANDING" ACTION



NO
CHAIN-ETCHINGS
WITH EASY



NO
SWIRLS OR CROSS-
GRAIN WITH EASY



NO
LAPS OR GOUGES
WITH EASY

**A GOOD
FINISH
CREATES
CONFIDENCE**



Precision machine tools deserve a good finish. For an attractive final finish, filler (plaster) coat must be sanded smooth and level. EASY'S back-and-forth action has proven ideal for this work. It will not cut etchings, swirls, laps, gouges or waves.

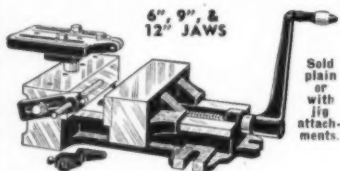
RUGGED — POWERFUL

Write For Literature

DETROIT SURFACING MACHINE CO.
7432 West Davison Detroit 4, Michigan

1000's are Saving with it
..... Write for Facts
Easy RECIPROCATING
ELECTRIC SANDER

A good vise - and a lot more!



GRAHAM Multi-Purpose Vise

A beautifully made plain vise, constructed with surfaces flush, parallel and square—that's only the beginning. In addition, this vise becomes a many-purpose jig or fixture for positioning all sorts of plain, round and irregular shapes on drill press, radial, miller, shaper, planer, grinder for repeat-operation work. An accurate tool — a great time-saver!



"Adjust-angle" Knurl Holder

Many patterns
using only
straight knurls



On work up to $2\frac{1}{2}$ " dia., this Knurl Tool produces a variety of straight, spiral and diamond patterns, using only straight knurls. Shank made to fit your turret (or lathe tailstock). Equipped with Passing-over-stock feature if desired. Graduated adjustment of knurl angle.

For prices & details request Bulletin 41

GRAHAM MFG. CO.

51 Bridge Street, East Greenwich, R.I.

DRILL KIT WITH ELECTRIC DRILL AND BITS

A Drill Kit with "a place for everything and everything in its place" has recently been designed by the Mall Tool Co., Chicago firm. This handy kit obviates jamming a machinist's equipment together in a hodge-podge with the possibility of damaging or dulling the edges of drills and bits.

The Kit contains a rugged, heavy-duty No. 381, $\frac{3}{8}$ " Mall Drill with cord, eight hardened steel, high-speed drill bits, from $1/16$ " to $1/2$ ", in increments of sixteenths. Extra space is provided for intermediate sizes. The drill rack, in the top of the Kit is hinged in order that it may be pulled forward to remove drills, and pushed back when not in use.



The No. 381 Mall Drill is adaptable to hole sawing, grinding, sanding, polishing, and many other applications. The Kit comes in a steel case with hinged top, finished in red ripple. A strong clasp and carrying handle are provided. For complete information, write:

Mall Tool Co., Dept. BB
7740 South Chicago Ave.
Chicago 19, Ill.

**OUR
EFFICIENT
TOOL DESIGNING**

*means
better production
at a lower cost*

Efficient tool designing in post-war's competitive production is a "must". Our experience guarantees you tools — designed for economy of operation, resulting in your increased production at lower costs.

COLUMBUS DIE TOOL

and Machine Co.

930 CLEVELAND AVE., COLUMBUS 1 OHIO



**SAFETY
WORK-STOP**
for drill presses

Easily installed
and operated
Pull to work
it's locked—
Any angle



Stop No. Width (Table) Depth F. O. B. s.p. Weight

1 B	12 - 16	10 - 16	13.95	6 lbs.
2 B	16 - 24	16 - 24	15.95	8 lbs.
3 B	24 - 30	24 - 30	17.95	10 lbs.

KAY MANUFACTURING CO.
Columbus, Indiana

**The Very Best
Facilities for
Die Cut**

STAMPINGS

In short runs

Phone factory engineers in
principal cities

Or Write

MINNEAPOLIS 7, MINNESOTA

DAYTON ROGERS

Manufacturing Company

*Interchangeable
type and holders
for every
marking
need*



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Catalog
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NEW METHOD
Steel Stamps INC.

147 Jos. Campau

Detroit 7, U. S. A.

NILCO DIAL SNAP GAGE HAS HIGH ACCURACY

A new development in precision instruments is the Nilco Dial Snap Gage, announced by the Nilsson Gage Co. The framework of this device is machined from rolled magnesium, with 45° angles to provide rigidity, and to minimize the dimensional changes caused by variations in temperature fluctuations.

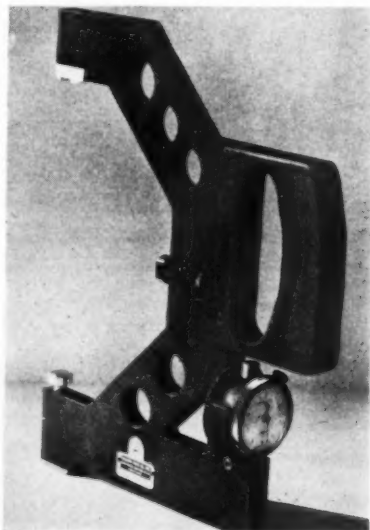
The use of a vernier type adjusting stud permits $\frac{1}{4}$ " adjustments to be made in the gaging pin or movable anvil. The adjustment can be locked, with the gaging pin still remaining free for checking.

The gage makes possible the use of a solid upper anvil block, which insures perfect parallelism at any setting throughout the entire range of the gage. A correct reading can be made as soon as the gage is applied, without the need of unsatisfactory "rocking" to obtain position.

To minimize friction, insure sensitivity, and increase service life of the

Nilco Dial Snap Gage, Nilsson engineers developed and incorporated the use of a cam actuated plunger, equipped with needle point bearings, to transmit the travel from gaging pin to indicator.

The device is completely shockproof, and cannot be damaged in the hands of inexperienced operators. There is no



LUCIFER

Electric Salt Furnace

Featuring square pot size 8" wide, 8" long and 10" deep.

Price \$350.00, F.O.B. Plant, Phila., complete with pyrometer, thermocouple, switches and automatic electric control.

Temperatures to 1650° F.

We also manufacture muffle furnaces.



Send for free literature
Some territories open for distributors.

GILBERT S. SIMONSKI
403 N. Broad St. Philadelphia 8, Pa.

loss of accuracy in its mechanism, since it will always repeat in exact accordance with the accuracy of the indicator. Complete details can be obtained upon request to:

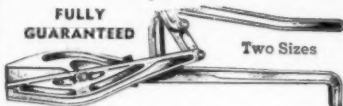
Nilsson Gage Co., Dept. BB
P. O. Box 505
Poughkeepsie, N. Y.

ENGINEERED CLEANING

Isometric drawings show features of Monorail Wash and Rinse Machine and Drum Type Batch Wash, Rinse and Dry. 4 pages. N. Ransohoff, Inc., Dept. BB, Cincinnati 16, Ohio.

ALL ALLOY PORTABLE SHEARS

FULLY
GUARANTEED



Two Sizes

No. 1 cuts up to No. 11 gauge strip or sheet.

No. 2 cuts up to 1/4" steel plate.

BREMIL MFG. CO.

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permit rotation thru

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Unique construction enables operators to rapidly
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fast moving objects or the smallest streams; no
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THE PYROMETER INSTRUMENT CO.

Bergenfield 3, N. J.

Every Shop Needs the Handy TRU-DRESS CROWN GRINDING WHEEL DRESSER



It trues up and
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trues cut-up and
uneven sides—restores accuracy
and improves cutting action of
grinding wheels. It dresses out
deep grooves—restores wheel bal-
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nomical.

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Industrial Products Co.
1507 E. 53RD ST., CHICAGO 15, ILL.



Carbide Tipped Centers

Essential for metal working lathes
where high speeds or extreme cut-
ting pressures are encountered. Tung-
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wear than any other metal. Entire
center precision ground.

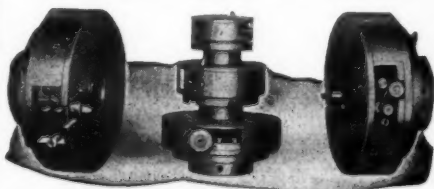
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South Bend 22, Ind.



MUMMERT-DIXON FACING HEADS with Automatic Feed

One-way Tool Feed — 6, 9 and
12" sizes.

Two-way Tool Feed — 9, 12, 16,
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Save many costly set-ups.

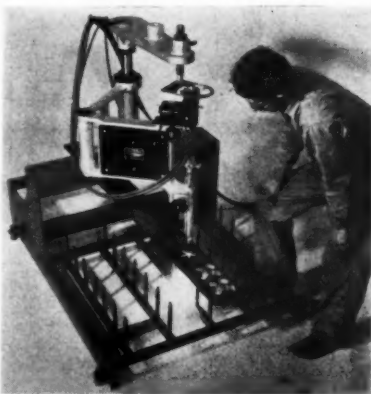
Bulletin No. 4141 Gives Full Details

MUMMERT-DIXON CO., 122 Philadelphia St., Hanover, Pa.

SHAPE CUTTING MACHINE FACILITATES SPINDLE TRACING

This new device, manufactured by the Ohmstede Machine Works, is designed to cut a wide variety of shapes within a cutting range of 65" x 30"; the circle cutting range is from 0 to 30". It can be used either as a portable or as a stationary unit. The overall dimensions are 36" wide, 60" deep, and 58" high. The maximum thickness of the cut accomplished is 8" with a standard blowpipe. The cutting speed is from 3" to 30" per minute, depending upon the material. All controls are located on the panel, within easy operating reach. The machine is provided with a variable speed motor which is equipped with a filter to extend motor life.

Torch controls are within easy reach during the cutting operation; offsetting the torch from the line of cut is accomplished by turning the handwheel in the required direction. Such offsetting enables the unit to produce cuts which are unscarred by the piercing operation.



Spindle tracing, using a template of plywood or similar material, is an outstanding feature. The spindle roller

◆ BLACK DIAMOND ◆

**PRECISION GRINDER FOR ALL SMALL DRILLS
COST SAVING TOOL — NEEDED IN EVERY MACHINE SHOP**



WHETHER you use small drills singly or in gangs—by hundreds or thousands—this moderately priced machine—motor driven—will keep any supply quickly available.

Anyone can operate a Black Diamond. Even the most inexperienced can keep all small drills sharp—and true centered, with smooth lips accurately ground to exactly the same length—at the proper angle and with correct clearance for fast, precision drilling.

Black Diamond Grinders cut 50% and more on drill grinding costs, sharpen without waste of expensive drill stock, reduce drill breakage and work spoilage to a minimum.

The built-in Diamond Point Dresser keeps the grinding wheel ever-sharp and the Web Thinning Attachment cares for all types of Notched points to perfection.

WRITE FOR COMPLETE DETAILS TODAY.

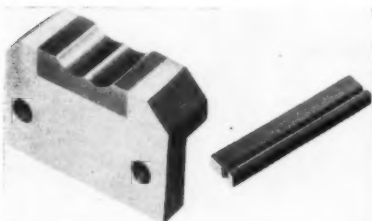
**BLACK DIAMOND SAW & MACHINE WORKS, INC.
45 NORTH AVENUE NATICK, MASSACHUSETTS**

may be held in manual contact with the template; in some cases, spring tension may be used, making the operation automatic. The template is fastened to its holder by a single bolt. The roller is brought in contact with the template, and the machine cuts an accurate reproduction of the desired shape. For complete details on the Model SC-30 Shape Cutting Machine, write to:

**Ohmstede Machine Works, Dept. BB
Beaumont, Texas.**

CARBIDE INSERTS ON WEAR PARTS

The production of wear parts with carbide inserts at the point of wear has recently solved several industrial problems on both products and equipment. Super Tool Co., specialists in manufacture of carbide tools and parts,



submit these pictures of a commercial stapler clinching die with carbide insert and associated solid carbide wire guide manufactured in their plant.

According to the manufacturers of the stapler in which these parts are used, they have yet to experience a failure or to learn of one of these parts wearing to the point where replacement has been necessary after four months of continuous operation. The same parts in hardened steel had an average life of only two weeks of continuous operation. The manufacturer will submit prints and quotations on parts of any size. Write:

**Super Tool Co., Dept. BB
21650 Hoover Road
Detroit 13, Mich.**

The finest of
all hack saw blades...

MILFORD

FLEXIBLE REZISTOR

MILFORD FLEXIBLE REZISTOR 12"
SHATTER-PROOF HIGH SPEED STEEL
EASY STARTING TEETH

is now made
better than ever
with M-2
high speed steel

This modern post-war steel means even more cutting . . . even faster cutting . . . for this outstanding blade which has been replacing all-hard blades with mechanics everywhere.

The same safe cutting, because it's shatter proof! The same economical cutting because there's no accidental breakage! Only the teeth are hardened . . . the back is tough and flexible. And the same easy cutting because of MILFORD'S exclusive Easy Starting Teeth.

This improved performance is typical of MILFORD'S continuous research, test and experiment. As better metal-cutting saw blades are made, MILFORD is making them!

Order from your mill supply distributor. He is always ready to serve your needs for all factory and mill supplies, as well as MILFORD hack saw and band saw blades.

MILFORD

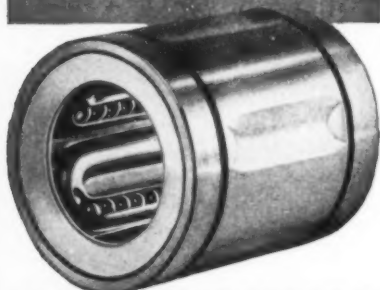
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Saw Specialists Exclusively for
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BALL BUSHINGS

Sliding linear motions are nearly always troublesome. Unlimited travel BALL BUSHINGS can be used to tremendous advantage on guide rods, guide posts, reciprocating shafts and for support of any mechanism that is moved or shifted in a straight line.

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ELIMINATE BINDING and CHATTER
ZERO SHAKE or PLAY
LOW FRICTION and WEAR
LONG LIFE — LOW MAINTENANCE
SOLVES SLIDING LUBRICATION PROBLEMS**

Now available for 1/4", 1/2", 3/4" and 1"
shaft diameters. Additional sizes to follow.

Write for literature and name of our representative in your city. No obligation, of course.

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PLANTS: Mineola, Long Island... Lancaster, Pa.

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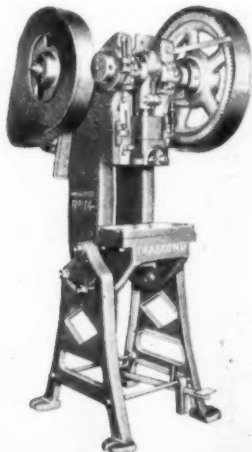
ROLL IT

DOES SLIDE IT

SMALL GEARED PUNCH PRESS HAS 14 TON CAPACITY

Believed to be one of the smallest back geared punch presses manufactured is this 14-ton open-back inclined geared press, manufactured by the Diamond Machine Tool Co.

This back geared press is recommended wherever the following requirements exist: approximately fifty per cent less strokes per minute; delivery of rated tonnage over longer length of ram travel; operations with extra long strokes; operations with drawing dies, forming dies and in blanking operations where a large amount of shear is required. It is also recommended with use of dial index feeds.



Specifications include: 65 strokes per minute maximum; standard stroke length, 2"; maximum length of stroke to order, 4"; bed area, 8" x 15"; shut die height on No. 14-A is 7 inches and on No. 14-B 9 inches. These presses have a non-repeat single trip mechanism.

Baldwin SR-4 strain gage analysis was employed in designing the Diamond line of punch presses, enabling company engineers to design the frames

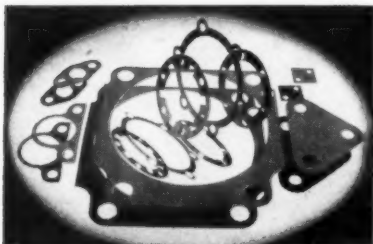
with maximum strength without resorting to "beefing up" techniques. A full report of the Diamond strain gage analysis and dynamic tests will be sent upon request. Write:

Diamond Machine Tool Co., Dept. BB
3429 E. Olympic Blvd.
Los Angeles 23, Calif.

STANDARD SHIM SETS AVAILABLE

A standard set of shims which can be furnished in any shape of any size with any arrangement of bolt holes has recently been made available. Each set consists of one 0.020" shim, three 0.005" shims and three 0.007" shims.

Individual shim sets provide for an unlimited arrangement of thicknesses and are recommended for use in sizes beyond which laminated shims cannot be furnished. Shim sets can be fabricated of steel, copper, brass, monel and other ferrous and nonferrous material.



The shims shown in the illustration indicate only a small portion of the wide range of shapes and sizes that have been or can be produced. Individual shims can range from 0.001" to 0.25" in thickness and overall shape size can be from 3/8" to 6 feet. Tolerances are held to 0.015" for overall shape and for bolt hole location.

Shim sets, consisting of any number of shims, in any range of thickness can be supplied to meet individual requirements. Write for bulletin No. A-8 for additional information.

U. S. Gasket & Shim Co.
Dept. 8-BB
Hudson, Ohio.

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NEW! • NEW!

• 18" VERNIER HEIGHT GAUGE

OUR PRICE

\$60.00

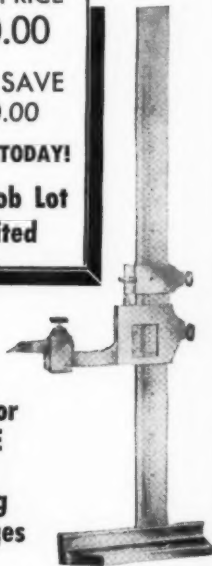
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**This Job Lot
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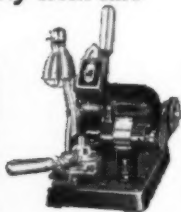
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128 Pages**



EASTERN Tool Supply Co.
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MILL SMALL PARTS...Fast— Accurately with this

NEW
Rouse
**HAND
MILLER**



\$98 (Without Fixtures)
F.O.B. Chicago, Motor Extra

Rouse
**Fixture Set-Ups
that Speed Pro-
duction.**



It's a high-speed, motor-driven unit that has many uses in finishing operations for light cuts on aluminum, brass, steel and other metals... also, rounding and burring steel and cast iron. Inexperienced operators quickly learn to use it with speed and precision.

The Rouse Hand Miller, with Rouse Fixture Set-Ups, provides fast, accurate, low-cost milling for a big variety of small parts used in electrical work, instruments, aviation, communications and similar work.

Available for immediate shipment. Write for illustrated circular and full details.

**H. B. ROUSE
AND COMPANY**

2216 N. Wayne Ave. Chicago 14, Ill.

NEW IDEAL VOLTAGE TESTER

Ideal Industries, Inc. announce a new Voltage Tester for testing continuity of circuits (AC or DC), 110 to 550 volts AC, 110 to 600 volts DC, blown fuses, grounded side of line, grounded side of motor or appliance, excessive leakage to ground, frequency (25 or 60 cy.) and DC polarity.

This new Tester eliminates the possibility of error and danger present when using outmoded test bulbs. Indications are by a solenoid indicator and a neon test lamp. This gives double protection, since each operates independently of the other. Securely anchored 2-foot leads are brought out through top of case, which makes it easy to handle and easy to read.

The Ideal Voltage Tester is sturdily constructed and encased in a plastic case.



Has easy-to-read scale calibrated from 110 to 600 volts. Overall length is 6". Test prod handles are 4" long; test prods are 2" long. The unit comes complete in a carrying case with belt clip. Weight—8 oz. For complete information, write: Ideal Industries, Inc., Dept. BB 1441 Park Ave., Sycamore, Ill.

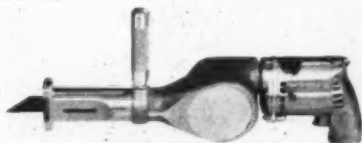
TRANSA GUN TYPE SAW ATTAINS 3000 R.P.M. FREE SPEED

A newly developed gun type saw has recently been announced by Transa, Inc. This modern and versatile tool will cut through any material from rubber to stainless steel: it has been proven to be valuable in a wide variety of operations,

in foundries, with sheet metal fabricators, in air conditioning plants, and with many types of artisans.

The Transa saw is provided with a blade of variable speed, enabling it to cut any material with the speed best suited to the particular substance. Speed setting is accomplished in 45 seconds.

The stroke is adjustable up to a full 2". When the tool is used for filing or scraping, this is an important feature.



Concentration of power on the cutting stroke is made possible by ingenious gear arrangements. Special guides for the various blade widths, from $\frac{1}{4}$ " to 1", eliminate whipping or cracking of the blades. These guides are also used as "gun" sights for ease in following a line. The tool is also equipped with a handle which can be moved both around the barrel and forward or backward, and locked in any position.

The Transa saw can be driven by an electric drill, or by an air drill and flexible shaft. It attains from 2500 to 3000 r.p.m. free speed; takes a $\frac{1}{4}$ " or $\frac{3}{8}$ " cap. For complete specifications and structural details, write:

Transa, Inc., Dept. BB
Suite 440-445 Gateway Bldg.
Minneapolis, Minn.

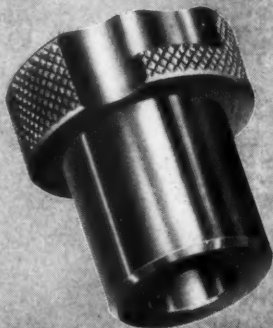
ANDERSONS INC. MOVE INTO NEW PLANT

Andersons, Inc. recently moved into their new ultra-modern plant at 6603 Diversey Ave., Chicago. This firm manufactures small tools, jigs, fixtures and also handles production machining and grinding.

The company, established just eight years ago, has grown into a thriving organization, sparked by the initiative and drive of its founder and president, Mr. William Anderson.



SUPERFINISHED
I.D.'s OF UNIVERSAL
DRILL BUSHINGS
wear longer —
save you money



UNIVERSAL ENGINEERING CO.
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ROTARY FILES

The Complete Line
for Every
Industrial
Purpose



GROBET FILE CO. of AMERICA

421 Canal Street New York 13, N.Y.

AUTOMATIC DIMENSIONAL RECORDING GAGE

Model 500 Recording Gage manufactured by the Federal Products Corp. measures a workpiece and records the resulting dimensions on a continuous tape which is ruled off in increments of thousandths and half thousandths of an inch. An accurate record of the dimensions of a workpiece as well as a permanent record are thus obtained automatically.

Model 500 has a range of 0 to 1" and will check within limits of minus .003" to plus .003". The chart is capable of recording 35,000 measurements without change. 450 measurements can be recorded on one foot of tape.

The Model 500 is easily operated by unskilled operators. It is compact, portable and entirely self-contained and can be readily modified to accommodate various-sized work pieces.

Federal Products Corp.
1144 Eddy Street, Dept. BB
Providence, R. I.

PRODUCTION STANDS OUT WHEN PROTECTION IS BUILT IN!

With Junkin Safety Guards on the Job, EVERY MINUTE is devoted to production—because costly, time-consuming accidents are eliminated.

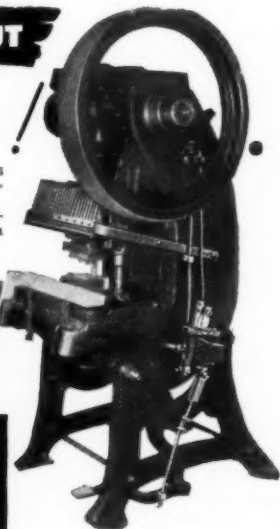
You reap the important benefit of improved worker efficiency too, for with this ever present evidence of protection press operators are able to hit new peaks of efficiency.

Send for bulletins describing the Junkin Safety Guard and Swinging Die Closure. Address:

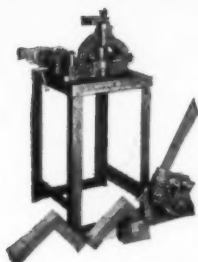
**JUNKIN SAFETY
APPLIANCE CO., INC.**
936 W. Hill Street,
Louisville, Ky.



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30 YEARS EXPERIENCE



**No. 455
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All size angles thru 2"x2"x1/4"

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WHITNEY METAL TOOL COMPANY
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**Monarch Precision
SHAPLANE
Radius Tools**

Patent pending

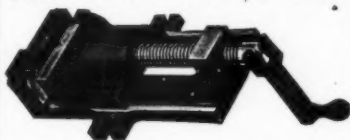


Four Models For
**LATHES, SHAPERS, PLANERS,
BORING MILLS**

**RANGE 1/2" To 3" RADIUS (MODEL ALSO
AVAILABLE FOR CONVEX CUTTING)**

C. B. TEETER
Tool Room Specialties
4470 Oakenwald Ave., Chicago 15, Ill.
Phone Drexel 3571

YOST DRILL PRESS VISE



This new Yost vise has been designed expressly for use on drill press operations. Does away with special and costly jig fixtures.

Offered in two sizes.

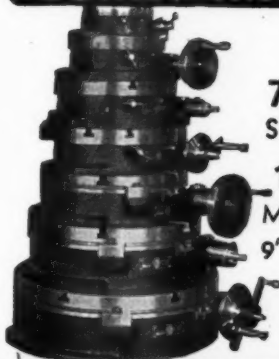
Vise No.	Width of Jaw, Inches	Opens Inches	Weight Pounds
1D	3 1/2	3 1/4	12 1/2
2D	5	5 1/2	23

Do you need a vise of ANY type?

*Write today for bulletins on
the extensive Yost line*

YOST MFG. COMPANY
1335 SO. MAIN ST.
MEADVILLE, PENNSYLVANIA

**SAVES
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T R O Y K E
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**7
SIZES
10
MODELS
9" to 25"**



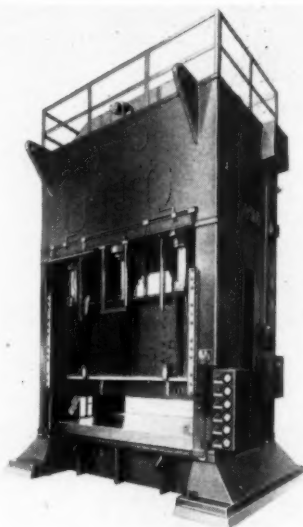
Catalog on request
TROYKE MFG. CO.
4122 Appleton St., Cincinnati 9, Ohio

VERSON MECHANICAL-HYDRAULIC DEEP DRAWING PRESS

Mechanical and hydraulic force have been combined successfully for the double action deep drawing of ferrous and non-ferrous metals in this new unit, known as the type MH Verson Double Action Press. This line has the productive capacity of the mechanical drawing press—plus the adjustable blankholder features previously found only in hydraulic presses. Advantages claimed for this combination mechanical-hydraulic press include increased production on deep draw; instantaneous adjustment of pressure by valves and direct reading gauges at any pressure point on the blankholder. The blankholder is self-adjusting for any thickness of stock and automatically compensates for minor variations in stock thickness during operation. The use of shims to obtain correct and uniform blankholding pressure is eliminated. There is no tool-damaging impact between blankholder, stock and die.

These presses can be converted quickly from double action to single action press work. The press cycle, including the delayed action return of the bed cushions, is fully automatic and controlled by means of an electric push button and selector panel.

This type of press is available in a



wide range of bed sizes and tonnage capacities and should prove of special interest to producers of deep drawn sections by the double action method or wherever both double action and single action equipment is required. Full details may be obtained from:

Verson Allsteel Press Co., Dept. BB
1355 E. 93rd St.
Chicago 19, Ill.

DIAMOND BAND SAWING MACHINE

The physical property of the diamond as a cutting tool has been applied to a saw band by the DoAll Technical Institute. The resulting Diamond Band Sawing Machine initiates a new process for cutting both hard metals and vitreous materials. The unit employs a diamond saw band, a flushing coolant, and a precision band sawing machine. Hardened steel, tungsten carbide, stone, and vitreous materials can be cut directly to a layout line with a precision comparable to that of conventional con-

ACCOMPLISHES CONTOUR CUTTING

tour sawing. In cutting direct to the desired contour, the material removed is salvageable, an important factor in cutting valuable materials. This eliminates the conventional method of shaping the material by multiple cuts with successive rough and finish contour grinding operations.

Greater cutting capacities, usually restricted to large diamond impregnated discs or mud saws with their wide kerfs, can be realized. The unit offers

a smooth edge that will give close dimensional control and a fine finish. There is no vibration when cutting thin work sections. By stacking thin materials and clamping them together, duplicate parts can be cut in one sawing operation.

Three types of Diamond Saw Bands will give results for general contour and straight cuts in a variety of hard materials. The 24-pitch diamond saw blade is recommended for cutting material up to 2" in thickness. The pitch of a diamond blade is considered as one foot. This band has two diamond impregnated segments per inch. The



8-pitch band has one diamond impregnated segment per each 1½ inch for cutting material 2" and over in thickness. The 1-pitch band has only one segment per foot; it is economical to use on thick work sections. The kerf left in the material by these bands is approximately 1/16" in width.

The Do All Company, Dept. BB
Des Plaines, Illinois.

CARBIDE DRILL FOR HARDENED STEEL

A new carbide drill for drilling hardened H.S. Steel registering as high as 66 on the Rockwell "C" scale is announced. It incorporates a special grind which results in faster cutting and less

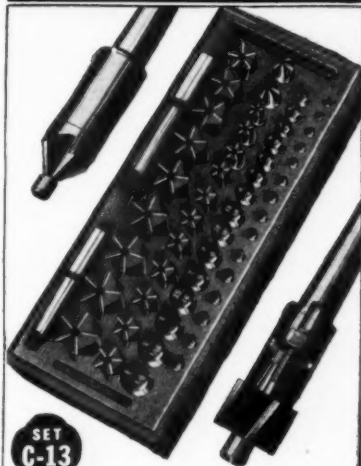
For heavy duty counterboring requiring rigidity, strength and perfect alignment, choose Gairing's type C. The handy kit shown below, gives you a wide range of cutter and pilot combinations.

COUNTERBORE SETS

Write for Folder and Prices

THE GAIRING TOOL CO.

Roosevelt Park Box 478, Detroit 32, Mich.



Sturdy box with hinged cover contains: holders C-12 and C-13; 20 cutters from ⅝" to 1¾"; 28 pilots from ⅜" to 1½" and two ⅜" countersinks, one 70° and one 82°.

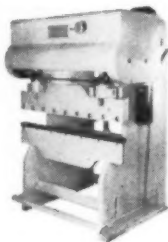
GAIRING
TOOLS

Built like a rock but **EASY** on the budget

●KNIGHT Press Brakes' features include heavy welded construction, generous bearings, all controls located in front. Micrometer dial permits adjustments to .001". Visible extreme ram position indicators. Many features found only on expensive machines . . . built into these low-cost press brakes designed to relieve your larger, more expensive equipment.

KNIGHT PRESS BRAKES

Available in four sizes: 24, 36, 48 and 60-inch capacities. Equipped with Link Belt anti-friction bearings, Cutler-Hammer controls, Reeves variable pitch pulley drives, Westinghouse motors, Twin Disc clutches. Designed also to facilitate quick and easy repairs and replacements.



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No. 9



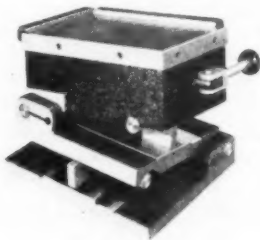
heat, with result that the drill holds up longer and produces smoother holes true to size without annealing the work, according to the manufacturer.

Holes one inch deep can be drilled in as little as 60 seconds with negligible wear on the drill. For details, write to: National Tool Salvage Co., Dept. BB 6511 Epworth Blvd. Detroit 10, Mich.

MAGNA-SINE FOR DETERMINING PRECISION SET-UPS

Robbins Engineering Co. announces that the Magna-Sine is now available with a permanent-magnet chuck. The Magna-Sine with electric magnet chuck has been widely accepted for precision angular set-ups on operations such as inspection, grinding, boring, etc. Angles are set up by the sine bar method, using standard gauge blocks. The Magna-Sine is built in models for single angles only and models for both single and compound angles. Both models are available in two sizes.

The new Magna-Sine with permanent-magnet chuck may be used on either wet or dry machining and grinding operations. With the permanent-magnet chuck, parts are not magnetized when removed from the chuck.



Details on the construction, use and sizes of the Magna-Sine are contained in a new bulletin. Write:

Robbins Engineering Co., Dept. BB
318 Midland Ave.
Detroit 3, Mich.



NOW! WILLEY'S TOOLS "Over-the-Counter"

**WRITE
FOR
CATALOG 30**

To insure fast service on tungsten carbide tools we have inaugurated an "over-the-counter" service at Detroit and in many other principal cities. From these stocks you can secure — in person or by mail — the complete line of Willey's standard tools and blanks, as well as many tools heretofore considered specials — reamers, face mills, shell end mills, core drills, centers, masonry drills, slotting cutters, gages, wire drawing dies and diamond dressers.

WILLEY'S CARBIDE TOOL CO.

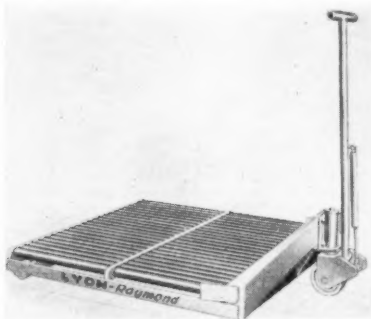
SOLE MAKERS OF WILLEY'S METAL

1342 W. Vernor Highway

Detroit 1, Michigan

SPECIAL TRUCK FOR SWITCHING PALLET

The problem of loading pallets inside a freight car and transferring them to a roller conveyor for movement to warehouse has been solved by material



handling engineers of Lyon-Raymond Corp. Empty pallets are placed on a special truck having rollers instead of a conventional platform. This truck can

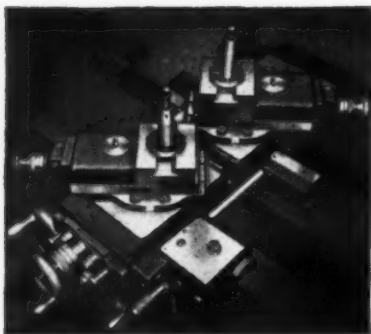
be moved about inside a freight car or motor truck so that palletized loads can be made up from goods being received. When the pallet is loaded, the truck is moved to the doorway where a conveyor is set up leading to the warehouse. One side of the truck is lined up with the end of the conveyor and the pallet is pushed on the conveyor system which carries it to the warehouse floor, where it can be stacked by conventional fork trucks.

The old method of loading pallets required that the empty pallet be placed on the conveyor, and that the goods be carried to it; by use of a pallet switcher the entire loaded pallet is moved at one time. Specifications, when designed to handle standard 48" pallets, include a double row of rollers on 2" centers. The top is 48" square and the truck is designed to handle loads up to 4,000 lbs. For further information:

**Lyon-Raymond Corp., Dept. BB
4990 Madison St.
Greene, N. Y.**

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

301



Double angular power feed compound rests

SPECIAL TOOLING INCREASES LATHE PRODUCTIVITY

Special attachments and tooling materially increase the usefulness and output of Rapid Production lathes produced by the R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.

The double power angular feed compound rests (above) for the 13" Rapid Production lathe is an example of the productive devices which can be supplied on new LeBlond lathes of this type. An almost unlimited variety of similar and related attachments and accessories is available for all 3 models.

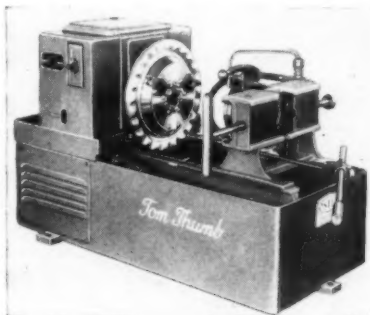
The LeBlond Rapid Production lathes, manufacturing machines for accurate, high speed production, are built in 13", 17", and 20" swing sizes. A number of optional headstocks provide the right speed-power combination for heavy stock removal on steel, or for obtaining mirror finish on non-ferrous metals.

The hundreds of variations designed by LeBlond for adaptation to difficult and exacting machining have speeded production and lowered costs for manufacturers all over the world. This experience is available for use in solving your metal working problems. For further information address the R. K. LeBlond Machine Tool Co., Cincinnati 8, O.

PORTABLE PIPE THREADING MACHINE

"Tom Thumb" No. 582 designates this electrically powered pipe and bolt threader. Standard range is $\frac{1}{4}$ " to 2" pipe. Range with special drive shaft $2\frac{1}{2}$ " to 8" pipe. Bolt range is $\frac{1}{4}$ " to $1\frac{1}{2}$ " pipe. Nipples as short as $3\frac{1}{2}$ " in the 2" size can be threaded on both ends without using a nipple chuck. (Other sizes in proportion.) Pipe or studs as short as $2\frac{1}{2}$ " can be threaded on one end. Regular equipment consists of the complete machine for bench use. A steel stand equipped with 16" wheels is furnished as optional equipment.

A new front chuck eliminates the need of a chuck wrench. A quick spin of the chuck wheel chucks and unchucks the pipe instantly. The rear chuck has three plain jaws, universal centering and quick action; this eliminates all loose bushings and out-board pipe supports, and assures straight threads on long lengths.



Die-Head is the quick-opening, adjustable floating type with top opening to permit view of thread as it is cut, and bottom opening for chips to fall into pan. Slides out of way for cut-off operation.

Dies are long-lead for easy starting and cutting. Any individual segment replaceable; quickly; easily sharpened. All dies adjusted simultaneously. For complete operational and performance data, write:

The Oster Mfg. Co., Dept. BB
2085 East 61st St.
Cleveland 3, Ohio.

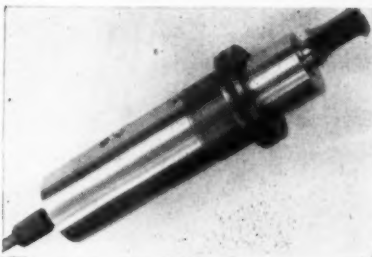
AUTOMATIC RECESSING TOOL HOLDERS

A new series of recessing tools designed for use with machines having automatic feeds is announced by the Maxwell Co. The recommendation of these tools to standard makes of automatic machines takes into consideration the increased feed at which machines are now being operated, as well as the desirability of reducing this feed for internal forming work.

These tools are operated by a draw-bar, having a telescopic adjustment for tool location. Circular form cutters, either high speed steel or carbide tipped, can be used. Adjustment for depth of recess is made by a collar on the tool holder body, which provides a rapid set-up of the entire tool for operation. The tool holders are available in a range of sizes to accommodate all standard types of slide tool holders.

Features also include rigid support for the form cutter over the entire range of tool capacity, a positionable cutting tool block, making it possible to design form cutters having a minimum

overhang, provision for introducing lubricant or coolant through the tool to the cutting edge, precision adjustment which is convenient for the operator,



and a set of variable length draw-bar components for operator's selection in using tool through a wide range of operations. For complete details:

**The Maxwell Co., Dept. BB
Bedford, Ohio.**

LITTELL
Pres-Vac
SAFETY FEEDER

**KEEPS
HANDS
OUT OF
DANGER ZONE**



YOU owe it to your workmen—to safe, fast production—to keep their hands out of danger zone—with the Pres-Vac Safety Feeder. Vacuum pick-up. Handles flat pieces of various weights and sizes. Trigger action. Me- Request chanical Pickers available. **Bulletin**

F.J. LITTELL MACHINE CO.
4153 RAVENSWOOD AVE. CHICAGO 13 ILL

ARMSTRONG - BRAY Gear and Wheel Pullers

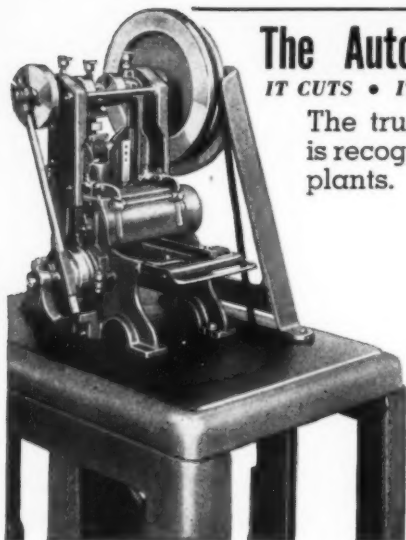
These powerful service tools Pull gears, wheels, bearings and bushings from shafts, easily and quickly. They eliminate pounding, battering and breakage of vital machine parts. They make tedious and risky jobs fast and safe. They usually pay for themselves in the first job, and give years of satisfying service.



12 types, 40 sizes (including special designs for special application) with Drop forged arms and heat treated forcing screws.

Write for circular
ARMSTRONG BRAY & CO.
5364 Northwest Highway
Chicago 30, Ill.





The Automatic FLEXOPRESS

IT CUTS • IT PUNCHES • IT PERFORATES

The true value of FLEXOPRESS is recognized in all well equipped plants.

- Completely automatic — one operator tends 6 or more presses.
- High speed production—9,000 to 40,000 pieces per hour.
- Cuts light metals and other materials in lengths to 9 inches.
- Low tooling costs.

WRITE FOR INFORMATION

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K K K K K
DIAMONDS
FOR WHEEL DRESSING TOOLS
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DIAMONDS
FOR THREAD GRINDING TOOLS
K K K K K
DIAMONDS
FOR ALL INDUSTRIAL PURPOSES
K K K K K

KOEBEL
KOEBEL DIAMOND TOOL CO.
9456 Grinnell Avenue, Detroit 13



POWER PRESS SAFETY GUARD

With Automatic
Counter

Counter Won't
Register Unless
Guard Is In Place

Guard sweeps across feed area on downward stroke of ram. Flat arc of guard arm travel provides greatest possible protection. Entire

guard is easily swung aside while press adjustments are made.

**Today is the Day to Prevent
Accidents**

FITS ANY PRESS • 30 DAYS' TRIAL

Send for Bulletin 125

SEARJEANT METAL PRODUCTS, INC.
89-95 Allen Street Rochester 6, N. Y.



ATLANTIC for GEARS

Our service on small gears, due to new equipment recently installed, will interest you.

Send samples or blueprints for quotation.

ATLANTIC GEAR WORKS, INC.
198 Lafayette St., N. Y. 12, N. Y. CAnol 4-1441

BURR KEYSEATERS



Mill keyways in the run or on the ends of shafting already erected—save money on alteration, erection, and repair work.

Made in 4 sizes, for hand or motor operation.

Write for Bulletins and prices.

JOHN T. BURR & SON
429 Kent Ave., Brooklyn, N. Y.

KNURL it Easily, Quickly, Safely

Use any Standard Knurl $\frac{1}{8}$ " x $\frac{1}{4}$ "



Two Sizes:
1/16" to 2"
2" to 4"

FOR LARGE OR SMALL LATHES

Joseph B. Fakes & Co., Royal Oak, Mich.



COOLANT PUMP

For metal working lathes and other machine tools. Consists of self-priming pump, tubing, reservoir, mounting tray, motor, switch, and wiring. Reservoir intake fitted with strainer. Write for dimension sheet. Price with $\frac{1}{4}$ h.p., 1 ph. motor, f.o.b. factory

\$103

SOUTH BEND LATHE WORKS

426A E. Madison St.
South Bend 22, Ind.

CAMS

Our ROWBOTTOM cam cutting facilities are at your disposal for your cam requirements.

Let us have your inquiries.

BLOOMFIELD TOOL CORP.
36 Farrand St. Bloomfield, N. J.

PRESS BRAKE DIES

And Punching - Notching Equip.
Engineering Service

THE CINCINNATI SHAPER CO.
GARRARD STREET CINCINNATI 25, O.

60 YEARS' Manufacturing

Multiple Spindle Drilling and Tapping Machines — Automatic Drilling and Tapping Units — Multiple Spindle Attachable Drill Heads — Hot and Cold Swaging Machines — Hammering Machines — Tools, Jigs & Fixtures Contract Work — Special Machinery.

LANGELIER MANUFACTURING CO.
PROVIDENCE 7, RHODE ISLAND

High Speed Cutting Tools

- special high speed circular, dovetail, flat form and special tool bits.
- Design and manufacture of small machines, jigs, gages and experimental parts.
- Regrinding and salvaging high speed flat form, special bits and small flat broaches.

DELIVERY AS REQUIRED
WRITE FOR QUOTES

Attractive Proposition for Representatives
Lincoln Park Manufacturing Co.
3302 Dix Road Lincoln Park, Mich.

Appointments and Promotions

Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit Mich., announces the appointment of **Farrel B. Weber** as sales manager, and the resignation of the position of secretary by **A. J. Prentice**. Mr. Prentice retains the position of treasurer.



Farrel B. Weber



A. J. Prentice

• • •

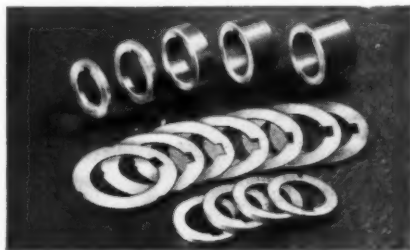
The National Bureau of Standards, Washington 25, D. C., has appointed **Joseph H. Van Trump** and **Paul V. Horton** to the Ordnance Development Divn.; and **Russell E. Dorrell** and **William B. Haliday** to the Electron Tube Laboratory.

The Hinderliter Tool Co., Divn. of the H. K. Porter Co., Inc., Pittsburgh 22, Pa., announces the appointment of **J. E. Sawtelle** as manager of the Export Division. **William Lee** has been appointed district manager of the new Houston, Texas sales office.

The Putnam Tool Co., 2981 Charlevoix Ave., Detroit 7, Mich., announces the recent appointment of **Douglas Straith** as field sales and service engineer.

PACKAGED PRECISION

MACHINISTS HAVE LEARNED TO RELY ON DE-STA-CO Arbor Spacers and Shims for milling, slitting, gang-saw set-ups and for shimming gears and bearings. De-Sta-Co long-life steel Spacers are packaged in a standard range of sizes from $\frac{3}{8}$ " to 4" hole diameter, up to $5\frac{1}{2}$ " outside, thicknesses from .001" to .125", all with keyway. Shims are stamped and coined to commercial tolerances in the same preferred sizes, without keyway.



Special spacers—thicknesses greater than .125"—are also available in popular sizes, machined from bar stock, hardened and ground, with standard keyways and thickness identifications.

Handy spacer kits of 19 graduated decimal thicknesses are stocked by Mill Supply Dealers in principal industrial centers. Order your Packaged Precision Today.

Your De-Sta-Co Toggle Clamp Catalog No. 47 is waiting for you. Send for it!

DETROIT STAMPING COMPANY

347 Midland Ave.

Detroit 3, Mich.

Sintercast Corp. of America, N. Y., announce appointments of **Jan M. Krol** and **Robert Lane Pettibone** as chief metallurgical engineer and research metallurgist, respectively.

Koppers Co., Inc., Pittsburgh 19, Pa., has announced the appointment of **D. Hamilton** as manager of the division's Building Materials Section.

Ernest V. Moncrieff, formerly president of the Swan-Finch Oil Corp., RCA Building, New York, has been elected chairman of the board, and **Howard F. Moncrieff**, formerly vice-president in charge of sales, was elected president and chief executive officer.



Ernest V. Moncrieff



Howard F. Moncrieff

• • •
Donald L. Herr, has become associated with the engineering department of **Allen-Bradley Co.**, Milwaukee, Wis., to develop servo-mechanisms for machine tool and other motor controls.

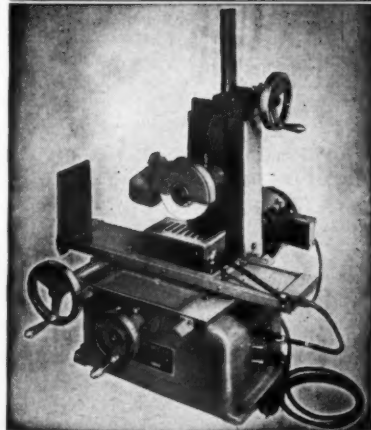
Charles H. Harris has been named manager of the new Decatur, Ill., Works of the **General Electric Plastics Div.** (Pittsfield, Mass.).

L. B. McKnight and **O. W. Carpenter** were elected directors of **Chain Belt Co.**, Milwaukee, Wis., at the annual stockholders meeting.

Edward Quekels, has been named director of a newly created product development and service department of the **Bear Mfg. Co.**, Rock Island, Ill.

Walter V. Hall, will take over sales of **Automotive Alinement** and **Industrial Balancing** equipment.

SANFORD



High-Speed BENCH SURFACE GRINDER

ACCURATE WITHIN .0001

A sensitive machine built to rigid standards of accuracy and workmanship specially designed "For the job that fits in your palm."

WRITE FOR BULLETIN

SANFORD MFG. CO.

1020-28 Commerce Ave.

Union, N. J.

FOR FITTING OF
GEARS AND UNUSUAL PARTS

Use **TIMESAVER**
LAPPING COMPOUND



A powdered abrasive prepared especially for applications where fine lapping, perfect control and freedom from imbedment (charring) are imperative.

- Absolutely non-imbedding
- Diminishing (self-reducing) action
- Becomes totally inert thru use
- Laps all metal from soft babbitt to hardened steel
- 29 years of successful use

Write for samples and literature

TIMESAVER PRODUCTS CO.

739 W. Monroe St.

Chicago 6, Ill.

George F. Burditt has been appointed sales engineer to join John N. Harper in representing American Wheelabrator & Equipment Corp., Mishawaka, Ind., in the Pittsburgh territory.

Ferracute Machine Company, Bridge-ton, N. J., has announced the appointment of **C. Paul Denekla** as sales representative in the Philadelphia district.

Harry M. Hubbard has been appointed district representative for the Cleveland and Northeastern Ohio territory of the Waltham Grinding Wheel Co., Waltham, Mass.

John C. Markey, president, The Aro Equipment Corp., Bryan, Ohio, announces the election of **Walter C. Leitch** as vice president and general manager. **R. W. Morrison**, manager of the Air & Tool D.v. also announces the following appointments: **J. W. Littleton**, manager of the Detroit territory; **L. O. Barrett**, division manager in Cincinnati; **C. Hoffman**, special sales representative; **E. A. Granzow**, division manager in Chicago; **E. T. Fairchild**, assistant to G. M. Gille, in St. Louis; **B. Broekhuizen**, representative in Atlanta; **H. J. Connell**, assistant manager, New York office; **W. Y. Smith**, assistant manager in New England.



Walter C. Leitch



Clarence J. Smith

Hydro-Line Mfg. Co., of Rockford, Ill., announces the appointments of **Frank G. Bastable** as sales representative in the mid-west territory and **Clarence J. Smith** as chief engineer.

**'New' NESTING TYPE
TOTE PANS**

20" Long x 12"
Wide x 6 1/4" Deep
16 Ga., drag holes,
handles both ends.



J. L. LUCAS & SON, INC.
BRIDGEPORT 5, CONN.



ABRASIVE CENT-R-LAP TOOL

Saves time, eliminates diamond dressing. Cones changed in seconds. Available in 2 sizes 3/4" and 1/2" Cent-R-Laps and abrasive Cones.

Write for descriptive literature and prices.

J. R. Reich Manufacturing Co.
45 E. Stroop Rd. Dayton 9, Ohio



ACE

DRILL JIG BUSHINGS

A. S. A. STANDARD
Immediate Delivery
on standard sizes
Fast service on specials

(Write for Catalog and Discount Sheet)

WEST COAST AERO TOOL CO.
5401 Fountain Ave., Los Angeles 27, Calif.



Save Space and Lifting

Yohe Racks take less floor space—hold more stock and require less lifting. Four arm rack, 51" high stacks, 10,000 lbs. Five arm rack 51" high holds 12,000 lbs. Flat or round stock—at safe lifting heights. Use against wall or back-to-back in center of room.

Let us send details and prices.

WM. S. YOHE SUPPLY CO.
609 Mahoning Rd., N.E. Canton, Ohio

**Accurate Hole Transfer Made Easy With
NIELSEN TRANSFER SCREWS**



Simply insert in holes, invert, strike sharply and you have centers and drill circles perfectly located. Reduce time and eliminate spoils of other methods. 7 sizes U.S.S.—Inexpensive—last for years.

Write for Circular
**NIELSEN TOOL &
DIE COMPANY**
1962 W. Eleven Mile Road,
Berkeley, Mich.

MOTOR MICA

TRADE MARK REG. U. S. PAT. OFF.

ANTI-FRICTION COMPOUND

SERVING INDUSTRY FOR 34 YEARS

Cools hot bearings • Solves toughest lubricating problems • Saves wear on moving parts • Works wonders with cutting oils • Packed in 5-10-25-50-100 lb. containers. Write for Free Sample.

SCIENTIFIC LUBRICANTS CO.
3469 N. Clark St. Chicago 13, Ill.



CUB

**VARIABLE SPEED
TRANSMISSION**

For "A" section V-belts—3.3—1 speed range—perfect belt alignment in all positions. Priced so low that no shop or machine need go without infinite speed selection. See your dealer or write.

\$16.50
(3 Types—8 sizes to choose from)

Standard Transmission Equipment Co.
3409 VERDUGO ROAD LOS ANGELES, CALIF.

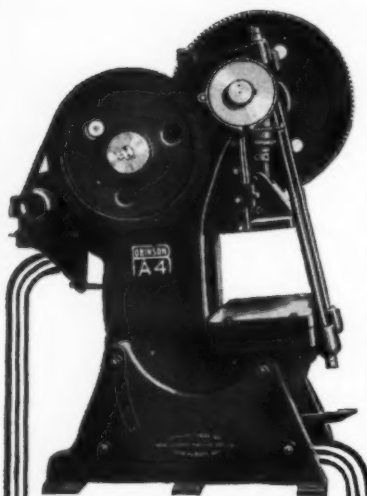
GRIND IT on Your Lathe



A powerful External Grinding Attachment for sharpening reamers and cutters, grinding hardened bushings, etc. Has precision ball bearing spindle with 4" x 1/2" grinding wheel. 5 sizes for South Bend Lathes—adaptable to others. Write for dimension sheet. Price with 1/4 h.p., 1 ph. motor, f.o.b. factory

\$49

SOUTH BEND LATHE WORKS 428A E. Madison St. South Bend 22, Ind.



The ROBINSON Inclinable PUNCH PRESS

The new and improved Series A Robinson Punch Press is noted for safe, dependable operation. Sturdily built and employing finest construction features, a Robinson Series A offers years of trouble-free operation at minimum maintenance cost. Five sizes now available for immediate delivery.

New Albany Machine Mfg. Co.
NEW ALBANY, IND.

ROBINSON
Inclinable
PUNCH PRESSES

The Pennsylvania Salt Mfg. Co., Philadelphia, Pa., have appointed **Charles R. Sorber, Jr.**, as St. Louis, Mo. district sales representative, Special Chemicals Division.

Ronald S. Drysdale has retired as special representative in charge of metalworking and cutting oils for Sun oil Co., Philadelphia 3, Pa. Mr. Drysdale will continue with Sun Oil Company as a special consultant.



Ronald S. Drysdale



Frank M. Mason

Frank M. Mason is now vice president in charge of the Atlantic plant of U. S. Electrical Motors, Inc., Milford, Conn.

Allegheny Ludlum Steel Corp., Pittsburgh 22, Pa., announced the following appointments: **R. J. Bryan**, plant manager of the Buffalo Foundry; **P. K. Koh**, associate director of research in charge of Tool and Die Steel and Allied Products; **George I. Bottcher**, assistant chief engineer; **C. M. Binney** as assistant district manager of the New York Sales District; **Merle J. Graham**, manager and **Frank G. Benford**, assistant plant manager of the West Leechburg, Pa. plant.

Malcolm S. Clark, president of the Federal Machine and Welder Co., announces the following appointments: **Allen R. Kelso**, executive vice president and general manager of the Warco Press and Warren Stamping Divisions; **Walter Dinse**, vice president and general manager of the Welder Division; and **Henry A. Stix**, treasurer and comptroller.

News of the industry

"SELF-HELP" UNDER MARSHALL PLAN STRESSED BY BERNA AT ELECTRIFICATION FORUM

Speaking at the 12th annual Westinghouse Tool Electrification Forum, Buffalo, April 22 and 23, Tell Berna, general manager, National Machine Tool Builders Association, stressed the importance of sending machine tools to Europe under the Marshall Plan. With the help of American machine tools, European nations can rebuild their manufacturing and production facilities in line with their own design and construction. Railroad equipment, agricultural machinery, mining machinery and textile machinery are urgently needed, Mr. Berna declared, and could be built easier and faster with machine tools which we can furnish. Repairs and spare parts could also be easily produced. This "self-help" will furnish employment, Mr. Berna continued, and boost the morale of Europeans much better than if they were furnished ready-made American equipment.

Among other speakers at the Forum was Mr. W. F. Armstrong, vice president, General Motors Corporation, who complimented the machine tool industry on many of its new designs shown at the Chicago show. Many of the improvements embodied in the latest machine tools had long been desired by the automobile industry, he declared. Mr. Armstrong cited some very interesting figures regarding his company's annual investment in new machine tools.

An address by Carl Taylor, president, Waukesha State Bank, was received with an ovation by his stirring defense of the American standard of living and his conclusions that America's greatness was the result of native ingenuity and freedom of action.

EXCELLENT TECHNICAL PAPERS

Among the technical papers which more than repaid the attending machine tool engineers was one by Kermit T. Kuch, chief engineer, Monarch Machine Tool Company, on the electronic controls. Mr. Kuch described the efficient electronic controls on some of Monarch's lathe models. These controls are now so compact that they fit easily into the cabinet leg and bed of the lathe.

E. P. Bullard III, vice president, Bullard Company, described the Man-Autrol power plant which drives and controls their three-spindle automatic lathe which permits the turning of three identical shafts simultaneously.

Frank Glassow, application engineer, Barber-Colman Company, described the electrical testing technique used in conjunction with the sharpening of form relief tools.

The "electro-magnetic feeler system," which consists of a tracer finger which follows the master while an end mill, controlled by the tracer, duplicates the master, was described by J. J. Jaeger, electrical engineer, Pratt & Whitney,

WANT LONGER TOOL LIFE
 ... LESS DOWN TIME?
 IT'S BEING DONE
 WITH **LUSOL**
THE TOOL SAVING FLUID
 SUCCESSOR TO
 ORDINARY CUTTING OIL
 AND
 SOLUBLES



**THE NEW DAY
 COOLANT THAT
 SPEAKS FOR ITSELF**

The word is spreading . .
 a trial will convince you

write - wire - phone

**F. E. ANDERSON
 OIL COMPANY**

712 BROWNSTONE AVE.
 PORTLAND, CONNECTICUT

Division of Niles-Bement-Pond Company. This tracer control on their Keller machine has solved many of the die problems in the automotive industries, resulting in such advances as the pressed steel turret tops.

Among other speakers were: E. Griffiths, R. S. Teetsell, G. H. Welch, G. A. Caldwell and L. W. Herchenroeder of the Westinghouse Co., Nelson P. Bashor, electrical engineer, W. F. & John Barnes Co.; Myron S. Curtis, assistant director of engineering, Warner & Swasey Co.

Chairman were: F. D. Weatherholt and E. G. Forgy of Westinghouse; W. B. Wigton, Cincinnati-Planer Co.; and E. E. Opel, National Automatic Tool Co., was chairman of the open forum, a highlight of each machine tool forum. R. S. Kersh opened the forum and acted as toastmaster at the annual banquet.

Credit for the 12th successful Westinghouse Machine Tool Electrification Forum should go to D. W. McGill of Westinghouse.

W. B. du MONT DIES

W. B. du Mont, president and director of The du Mont Corporation, Greenfield, Mass., died, March 22, 1948. Mr. du Mont founded the company bearing his name for the manufacture and distribution of "Minute Man" Keyway Broach Kits and other time-saving tools. Born in Sheffield, Alabama, Mr. du Mont came to Greenfield at an early age and was long identified with the development and growth of the tap and die industry. After completing the apprentice training course at Greenfield Tap and Die Corp. he became a member of the sales department and later the export department. Following service in the U. S. Navy during World War I, he rejoined Greenfield Tap and Die as export sales manager.

In 1925 Mr. du Mont was made general sales manager of Greenfield Tap and Die Corp. and later became vice president in charge of sales and a director. In 1939 he resigned and became vice president and a director of Threadwell Tap and Die Co., of Greenfield, then chairman of the board of this company. He resigned to found The du Mont Corporation in 1946.

MIDWEST TOOL MANUFACTURING PLANT MOVES TO OHIO

The Midwest Tool & Mfg. Co., producers of metal cutting tools and other products in Detroit, Michigan since 1911, has removed its plant, manufacturing facilities and executive offices to Upper Sandusky, Ohio.

According to Geo. E. Sheldrick, Jr., vice-president of the company, the entire transition following a carefully prepared moving program, was accomplished in a few days and with a minimum stoppage of production operations.

The new plant, of modern, one-floor construction, provides almost twice as much operating floor space as their former plant and has been equipped with additional machinery and facilities for increasing the production of Midwest Metal Cutting Tools. Provisions have been made for the manufacture of other related lines.

Company operated branch offices are being retained in Detroit at 2360 West Jefferson Ave., and in Chicago at 549 West Washington Blvd.

ISLAND EQUIPMENT CORP. MOVES INTO LARGER PLANT

Island Equipment Corp., has negotiated for new and larger quarters in which the general offices and factories will be consolidated, all under one roof, with increased facilities and floor space, in order to take care of their rapidly expanding conveying manufacturing business.

The new plant is the modern structure formerly occupied by Brewster-Rolls Royce organization at 27-01 Bridge Plaza North, Long Island City 1, N. Y.

All their alterations and moving were expected to be completed by May 1, 1948.

LANDIS APPOINTS DISTRIBUTOR

K. P. Wesseling Co., 1221 Locust St. St. Louis 3, Mo., has been appointed sales distributor in eastern Missouri and southern Illinois for the Landis Tool Co., Waynesboro, Pa.

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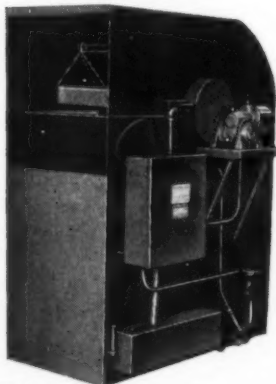
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SERVICE

PHILLSOLV...

the perfect cleaning solvent for all metals or combinations of metals. PHILLSOLV will not affect or stain highly polished surfaces. Send for **FREE Booklet** "Questions and Answers on Vapor Degreasing".

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WILSON P. HUNT—1873-1948

Wilson P. Hunt, co-founder of Moline Tool Co., passed away April 4, 1948, in Moline, Ill. Mr. Hunt started work August 15, 1890, as an apprentice at Williams-White & Co. where he learned the machinist's trade. From there he went to Deere & Mansur Works, where he was employed in the experimental department. In March, 1901 Mr. Hunt, together with George Ahrens, organized the Moline Tool Co. and he served as president and general manager of the company until 1926. Thereafter he acted as consulting engineer and held the office of vice president until his death.

In addition to his business and engineering pursuits, Mr. Hunt always was very active in religious and philanthropic work, both in his home city and in other areas. He was a member of Doric Lodge of Masons, Moline Consistory, The Rotary Club, and was a former director of the National Machine Tool Builders' Association.

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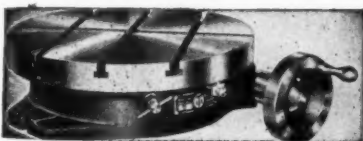
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900 Nevada Street Marshalltown, Iowa

OBSELETE MACHINE TOOLS BLAMED AS CAUSE OF LOW METALWORKING EFFICIENCY

The American metalworking industry, backbone of the nation's production, in peace as well as in war, and comprising about 1-3/4 million machine tools, is operating at not more than 65% efficiency because it continues to use obsolete machine tools.

This was the keynote of the address by A. G. Bryant, president of the National Machine Tool Builders' Association, at the 46th Spring Meeting of the Association at the Drake Hotel, Chicago, on April 8, 1948.

"American metalworking industry is suffering unnecessarily from obsolescence caused by the fact that 90% of the machine tools it uses are of prewar design.

"The most productive machines the world has ever seen were displayed at the 'Machine Tool Show' last September here in Chicago. But these better machine tools can earn no profit until they have been put to work in a manufacturing plant. We are not paying the wages, paying the dividends, or securing the lower costs for consumers that these machines make possible.

"The metalworking industry of America could, with the same manpower, increase output as much as 50%, if it were equipped with the 1948 models of machine tools," Bryant said.

He stated there are three principal reasons for the inertia which delays needed rehabilitation.

"First in importance is lack of understanding of the value of the up-to-the-minute machine tools by the 'front office' of industry. . . .

"Second is the difficulty placed in the path of business by the interpretations under the tax laws of the regulations governing depreciation. . . .

"Third is the contraction of venture capital available for capital expenditure. Regulations which require corporations to distribute a large share of current earnings in dividends to stockholders, when the funds so paid out may be needed for rehabilitation or for neces-

sary reserves, ignore the precepts of good management.

"Manufacturing corporations have an obligation to the public to produce a maximum of the articles needed by society," Bryant said.

"They have an obligation, at the same time, to their shareholders and to the public to operate profitably and, in fact, to increase their relative earnings.

"Machine tools today average in sales price only about 50% above the 1939 price level. Compare this with the increase in labor rates of over 106%, with the increase in farm income of more than 200%, and with the increase in wholesale commodity prices of 111%, and we get one reason why machine tools today constitute industry's best investment. . . .

"As an industry we should translate our ideals into a program of strong emphasis upon sales management, so that we will do a better job in selling the 'front office' on the importance of investing in modern machine tools.

"Our keystone industry, composed of about 200 small and moderate-size manufacturers, admittedly has a task to make itself heard. Yet, in the name of American peace and prosperity, we must be heard.

"We ask that government act expeditiously in the removal of unsound depreciation barriers which actually limit government income while restricting production and increasing consumers' costs.

"We ask that government have an active realization of the place that machine tools have in the sound development of our European Recovery Program, not only to the benefit of rehabilitation in the needy countries, but as a means of conserving American dollars and alleviating shortages of American goods."

Condensation of speeches
on following pages.

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FIG. NO. 5 Adjustable type Machinists' Levels with ground and graduated vial. Grooved for use on shafting. Sizes 4", 6", 8", 12", 18".

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FIG. NO. 50—For setup and maintenance is accurate to 10 seconds. Graduations are in .0005" per foot. Packed in Instrument Case.

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HYDRAULIC
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MARK IT for MARKET

Modern Marking Machines now enable most manufacturers of metal components to identify their products at trifling costs. **TRADE MARKS — MANUFACTURER — PART NUMBERS PERMANENTLY ROLLED ON YOUR PRODUCTS** will help you market them.

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Speed with power with precision. PRECISE 40, the fastest, most powerful electric handtool made, weighs only 40 oz. Built for production. Mills, grinds, polishes, deburrs any material from file-hard steel to bronze, plastics, wood or rubber. Imagine, with tungsten carbide cutters PRECISE 40 mills the hardest steel!

PRECISE 40 in cool, shockproof, plastic case operates on AC-DC. Use it as a handtool or as a motorized quill in vise, lathe, mill or on your production set-up. Many accessories and rotary tools available.

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Also COOLFLEX Flexible Shaft attachment with 9-oz. air-cooled handpiece.

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THE NEW PRECISE 40

(NMTBA Cont'd)

A PUBLIC RELATIONS PROGRAM

(Taken from speech by Jerome A. Raterman, chairman of Committee on Public Relations)

Our Committee wrote a letter to find out what our individual member companies were doing in public relations, and arrived at a pattern which we are presenting herewith.

"Thought leaders" are found in every community. A list, together with methods to be used with these groups, follows: Employees: Open House is held for employees and their families; annual financial

reports are distributed; plant publications are used for messages; and literature is mailed to employees' homes.

Public Schools: Speakers are sent from companies to high school classes to tell about machine tools, or school groups are invited to visit plants.

Libraries: Most public libraries today are anxious and eager to get sound industrial material.

Ministers: A group of ministers and industrialists has been formed in Cincinnati to give the ministers industry's side of the picture.

Clubs, Associations and Discussion Groups: Some members have men available to speak at the Kiwanis Club, P. T. A., etc. Others report that their local Chamber of Commerce or Manufacturers' Association is developing a speakers' bureau for this purpose.

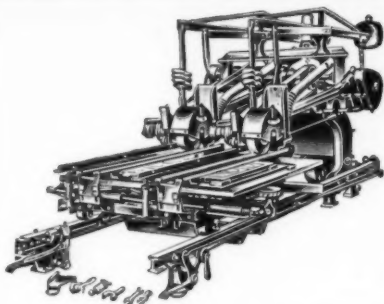
Foremen: Foremen should be instructed on the free enterprise

system, the gospel of productivity and function of machine tools in raising the standard of living.

Unions: It might not be a bad idea in shop committee discussions to bring in some of the philosophy of productivity upon which our business is founded, to correct possible erroneous thinking.

Radio: Two of our members report that a radio station is introducing local companies in a series of programs.

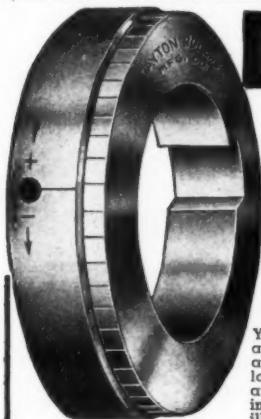
Newspapers: Groups of manufacturers have instituted local joint advertising programs telling about basic economics, tied directly in to local companies.



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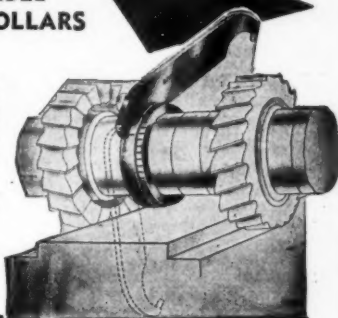
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NMTBA (Cont'd)

**IMPORTANCE OF RECOGNIZING 1948
COSTS**

(Taken from speech by Arnold K. Brown, chairman, Committee on Fiscal Affairs)

What we term costs is the price of doing business. If the price gets too high, the business fails.

As the articles that men make and use have become more complex, so has the matter of recognition—determination of costs—become more difficult and more important. Unfortunately the rapid growth of production, of which we

ledge of all the determinable cost elements in your business.

The second requirement for a successful enterprise—resolution to so regulate costs that the business may survive—is the prime function of management.

All of us are aware of these responsibilities of management. I mention them because they are an integral part of the cost element of business, and because—until relatively recently, our industry as a whole has not been hardpressed to regulate costs for several years. Prospects for future business are uncertain at the best.

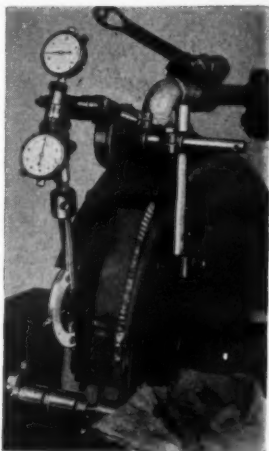
should be proud, and the resulting multiplicity of cost factors, with which by diligence we might be expected to cope, are not all that confront the modern business man. While enterprise has gradually been losing its freedom in the last decade or more under governmental regulation, and gradually losing its life under that government's unwise fiscal policies; as social evolution has been legislated by those who fondly believe that "the better world" is merely a statutory condition; while wage rates, hours of work, prices, and even the selection of a working force have been solemnly discussed and capriciously shuffled about by men whose knowledge of any of these is largely academic—during this period, the operation of business has become a gigantic guessing game. And your only possible hope of guessing right is to be secure in know-

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Well known. Visual reading. Grinding size and quality control on cylindrical grinders. Completely adjustable for all grinders. Thousands in daily use in U.S.A. Many in foreign countries.

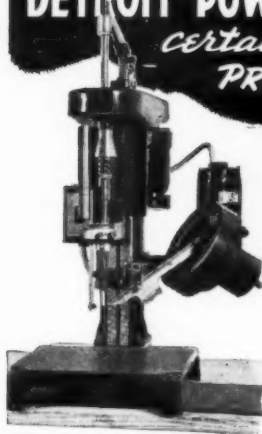
Diameter, diameter and length, splines, worms. Over 400 special designs for your problems.

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*certainly help Our
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Many a manufacturer knows from experience how important Detroit Power Screwdrivers are where

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If you have a production screw-driving problem, by all means investigate these modern, time, labor and money-saving machines. 3 models to drive screws from No 2 to $\frac{5}{8}$ " diameter. No marring of heads, no stripping threads, all screws driven to uniform tension.

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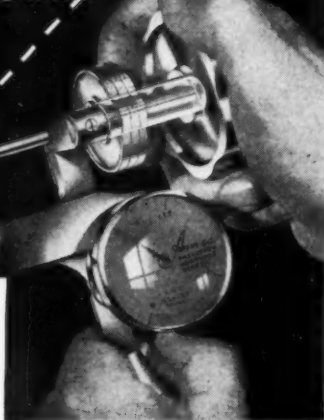


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QUICK • EASY • ACCURATE • DEPENDABLE

Used by steel men, motor and airplane manufacturers, shop men, fabricators. Work tested while in actual process. Hundreds in use. Salesmen, inspectors, service men use for accurate on-the-job tests.

Write for bulletin explaining operation and uses.

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(NMTBA Cont'd)

CHARTING THE SALES EFFORT

(Taken from speech by Bernard Lester, Management Consultant-Sales Engineering)

Few examples in modern industry show greater accomplishment and relatively less promotion than the machine tool industry. In many other industries, promotion has stepped forward to rival design and production. The demands of the last ten years calls for new skills in selling, finding customers, uncovering needs, presenting proposed results and convincing business men to invest.

executives and familiarize themselves with the problems of their sales engineers. The sales manager should plan campaigns, control sales, know his market and his sales engineers. The sales engineer's duties lie in trying to adapt his product to the needs of the customer and really knowing his product.

By charting the sales effort, an actual buying market can be created, not by altering the whims of customers but by establishing and meeting a need which results in better and cheaper goods for more people. This is "creating a sales department to do creative selling."

The customer should be put at the top of the organization chart, for he is finally the boss. Next the market must be studied. "Market development" implies continuing activity integrated with sales direction, budgeting and recording, determination of requirements and improvements, forecasting and the continuing activity of market development. The best time to make a market study is all the time. The best place is right where the salesman is. It must be simple and direct.

An effort must be made to sell new machine tools. There is a market, but a small one, made up of companies who already want machine tools.

Collectively, machine tool builders might reach their public through speaking and press programs aimed at banks, management, customers and the public.

Individually, top executives should visit customer ex-

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BUTTERFLY FILING and SAWING MACHINE

(Die Making Machine)

This is a very heavy, powerful machine and is designed for extra heavy filing and sawing, but it performs small work just as well. This type of machine is usually adopted in Ammunition Plants, Airplane Factories and machine shops where heavy and precision filing and sawing is desired. We also manufacture smaller models—Model D—10" Table; Model E.L.—12" Table. Model No. 14—14" table and heavy pedestals for all our machines.

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The No. B-3 BEVERLY Bench Type Shear with Ball Bearing Hold Down handles 3/16" or No. 10 gauge stainless steel. This sturdy shear weighs 58 lbs. and is equipped with H. C. H. Blades for heavy duty service.

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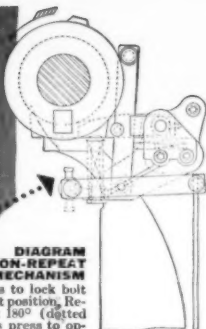
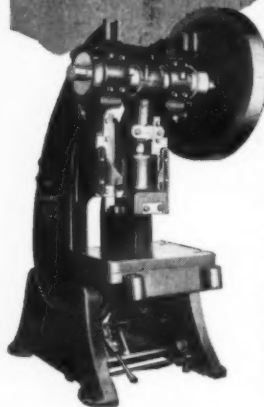


DIAGRAM
OF NON-REPEAT
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Arrow points to lock bolt in non-repeat position. Reversing bolt 180° (dotted line) permits press to operate continuously.



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PRESSES

(NMTBA Cont'd)

SELECTING SALES ENGINEERS

(Taken from speech by Robert L. Giebel, vice president of American Machine Tool Distributors' Association)

My contention is that, if the machine tool industry is to prosper, we must carefully check our sales organizations and sales methods. We must learn how to select better sales engineers, how to train them, and how to direct them.

Giving the buyer the service he expects, which is equivalent to that of a consulting engineer, takes a good solid foundation of practical shop training. The

ability to direct and train his men. He must be consistent, persistent and patient.

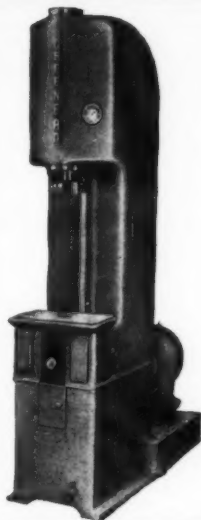
After the men are trained, they must be supplied with the proper and the best tools. A second-hand tool will bring second-hand results. If a salesman is successful, praise him; if he is unsuccessful, help him find out why he lost the order. If we want our men to be loyal and have confidence in us, we must first show them that we are loyal to them and have confidence in their ability. Keep number of forms to be filled out at a minimum.

theoretically trained engineer never gets the mechanical assurance a man does who gets his hands dirty working on a machine.

The salesman should be at least as well educated as the majority of the customers he calls on. How he gets that education, whether in schools or out, is immaterial.

All the personality qualifications have to be considered; and if a man has the essentials, a good training program can help supply the ones that are missing. The salesman must be in good physical and mental health to stand his rigorous daily schedule. It is important that he be an intelligent listener, and possess a creative imagination. After he is hired, the sales engineer needs constant reminders, inspiration and new ideas.

The sales manager must have all the qualifications a good salesman needs, plus the ability



The New High Speed Hydraulic Press

All Castings Meehanite Metal
For

Fast Assembly and
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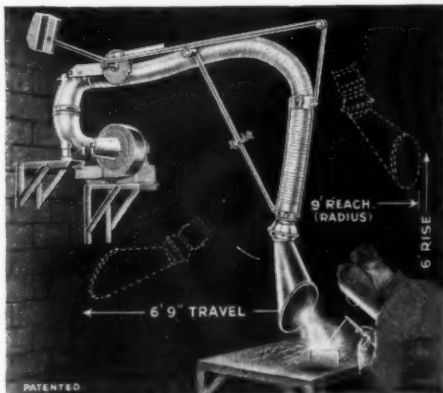
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Nashua, N. H.

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Why continue to let your employees inhale welding fumes? You can solve the problem quickly and efficiently by installing a Ruemelin Fume Collector. It produces a powerful suction that draws out noxious gases, smoke and heat at the source. Guards employee health, resulting in less welder fatigue, therefore, greater plant output. Clears shop air with minimum loss of building heat. Covers maximum welding area vertically, horizontally and by circle swing. Shipped assembled, easy to install, 9 ft. and 15 ft. sizes (radius of swing).



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New SOLID
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The Label of Excellence
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PRECISION CUTTING TOOLS

A CUSTOMER SAYS —

"Using Raymac SOLID CARBIDE CENTER-LAPS on hardened gages we have reduced costs, found this new tool a great aid to increased production."

Vinco Corporation

ORDER YOUR CENTER-LAPS TODAY! Standard sizes from stock: $\frac{1}{2}$ x $1\frac{1}{2}$ " to $1\frac{1}{2}$ x $2\frac{1}{2}$ "—60° included angle, or any degree angle to order.

Also midget and standard solid carbide grinding wheels, reamers, drills and burrs.

For greatly increased production and economy of operation, order tools with the "Label of Excellence."

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Lapping hardened plug-gage centers in standard center-lapping machine.

TECHNICAL SESSIONS FEATURED AT ELECTROPLATERS' CONVENTION

Technical sessions of the thirty-fifth Annual Convention of the American Electroplaters' Society, 473 York Road, Jenkintown, Pa. will hold the limelight for metal product manufacturers and the metal finishing industry at Atlantic City June 28 to July 1. Recognized experts will discuss how to produce better electroplated and other surface finishes, supplemented by a comprehensive exhibit of equipment and supplies at which manufacturers will show what to use to pro-

duce better finishes. Special attention will be focused on latest developments in electroplating and other forms of metal finishing.

Offered for presentation at the technical sessions will be papers on copper, brass, bronze, chromium, nickel, and zinc plating, barrel plating, plating on plastics, evaluation of strip plating and of decorative deposits, measurement of stress in deposits, metal cleaning, surface finish standards, electropolishing, phosphatizing, spray finishing, and coating of metal finishes.

The Industrial Finishing Exposition, also sponsored by the American Electroplaters' Society and occurring on the same dates as the Annual Convention, will take place on the main floor of the Atlantic City Convention Hall. The products of approximately one hundred manufacturers and suppliers will be exhibited.

The Convention and Exposition will be of great interest to the executive and technical personnel of all manufacturing plants concerned in any way with metal finishing, and particularly to those who are concerned with the inclusion of a large number of electroplated parts in their final products.

The Ambassador Hotel in Atlantic City has been designated as headquarters and place of registration for the Convention. Registrants at the Convention are not required to be members.



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ESCO ENGINEERING
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ESCO STANDARDIZED DRILL JIGS
will do that for you because . . .

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TAP BREAKAGE *Reduced*

**Square, Straight
Tapping in
Half the Time**

The Dahlstrom Tap Guide practically eliminates tap breakage and saves wasted hours getting broken taps out of expensive dies. It does the job in a jiffy with work always straight and true. Just fasten it to a post or bench, slip a Tap Adaptor into the spindle, and even an inexperienced operator can handle it. Equipped with 7 Adaptors, ranging from 8-32 to 1/2". Taps not furnished. Nothing in your shop will pay for itself faster.

Literature on request.

Dahlstrom Manufacturing Co.
416 So. Sixth Street, Minneapolis 15, Minn.



**52⁵⁰
F. O. B.
MINNEAPOLIS**

Dahlstrom TAP GUIDE

Severance CHATTERLESS TOOLS

HIGH SPEED
CARBIDE



Winning their way on job after job, they are carefully designed to preclude chatter and can be depended on to produce superior finishes.

Severance CHATTERLESS COUNTERSINKS

STANDARD TYPE —

Stocked in 13 diameters up to 2" and in 30°, 41°, 45°, and 60° angles (with C/L).

Sizes 1" and larger stocked also threaded for shanks — tapered or straight — in various sizes.

Use CARBIDE for tough jobs or high production.

HEAVY DUTY TYPE —
Features larger shanks having a tang drive.

Full range of sizes and angles.



HEADQUARTERS FOR COUNTERSINKS, REAMERS, SEATING TOOLS, and SPOTFACERS that preclude chatter

Severance BALL SEAT REAMERS



Standard and Heavy Duty Types 8 sizes each.

Made also for shaped cavities—as ordered.

BALL NOSE DRILLS —
In corresponding sizes hog out the stock for Ball Seat Reamers.



Severance TAPER REAMERS



- Faster cutting
- Better finishing
- Shear-cut teeth

Tapers up to 15° quickly supplied from stock — up to 1½" diameter x 2½" long.

Unexcelled for holes having keyways, ports, splines, cross holes, etc.

Write for Catalog 16

SEVERANCE TOOL INDUSTRIES INC.

722 IOWA AVE., SAGINAW, MICHIGAN

MIDGET MILL GROUP

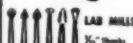
ADJUSTABLE
MIDGET MILLS



1" Shanks

JUMBO MILLS

1½" Shanks



¾" Shanks

DEBURRING GROUP



30° 45° INSIDE



30° 45° OUTSIDE



HAND RADIUS

TUBING GROUP

STANDARD Chamfering



SOLID (For Radius Tip)

liquids from one receptacle to another, lighting a cigarette, boring a hole, and writing a name.

In actual use the "hands" would extend over a protective eight-foot-high wall into a radioactive area but would be operated by remote control from a room outside the area, thus insuring against danger to humans from radiation, the scientists said.

The actual "hands" are similar to the double hooks used by amputees. They are at the lower ends of two arms which descend vertically from two horizontal shafts eight feet high across the top of the wall. Vertical arms come down from these at the other ends, and carry at the bottoms the handles with which the operator controls the device. He is seated and views his mechanical hands, eight feet away, with the aid of binoculars and a four-mirror periscope which looks over the wall. His feet are on pedals which control the grasping action of the "hands."

The general motion of the hooks corresponds to that given the handles, as they are moved up or down, forwards or backwards, or from side to side. In addition the handles can be turned around three axes, by wrist movement, and this causes the hooks to do likewise. The twisting of the wrists is accomplished electrically, so that the hands can be twisted around completely, any number of times, which is particularly useful when unscrewing a nut, for example.

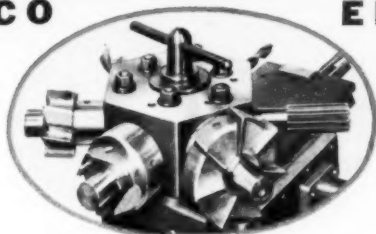
GENERAL ELECTRIC DEVELOPS MECHANICAL HANDS

Mechanical "hands," which in dangerous radioactive areas can perform delicate chemical experiments, operate machine tools, and do countless other tasks requiring great dexterity, were demonstrated for the first time by scientists of the General Electric Company, Schenectady 5, N. Y.

Principal part of a device known as a remote-controlled manipulator, the "hands" also proved they could perform such common jobs as slicing an orange, twirling spaghetti on a spoon, pouring

SELF INDEXING

ENCO



ENCO

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FOR ALL LATHES FROM 9" TO 16" SWING.

- * All Bearing Surfaces Ground and Hand Spotted
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- * Twin Gear Drive For Repetitive Accuracy
- * Dovetail Double Gib Construction Adjustable Front and Rear
- * Pilot Wheel for Sensitive Control
- * Turret Base Clear Lathe Saddle Wings
- * External Vise Grip Clamping

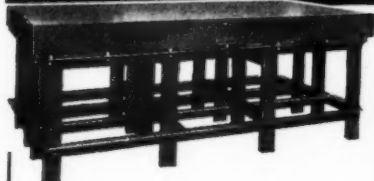
Also Mfrs. of Enco Turret Tool Posts For All Lathes.

ENCO MANUFACTURING COMPANY

Dept. 26 4522 Fullerton Ave. Chicago 39, Illinois

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Trouble-Free PRODUCTION**

**CHALLENGE Semi-Steel
Layout Surfaces PLATES**

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CHALLENGE SURFACE PLATE EQUIPMENT

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THE CHALLENGE MACHINERY CO.

GRAND HAVEN, MICHIGAN, U.S.A.



Allison COLLET CHUCKS

THE NEW ALLISON NO. 2 for $1\frac{1}{2}$ " 8-thread spindle lathes $\frac{7}{8}$ " collet capacity. This new chuck is made without ball bearings and is hardened and ground throughout. Place your order today for the New Allison No. 2 Chuck — Immediate Delivery — \$89.50. Replacement collets available.

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Allison MANUFACTURING COMPANY

526 North La Brea Ave., Los Angeles 36, Calif.

MONARCH TO OFFER ENGINEERING SCHOLARSHIPS

Directors of The Monarch Machine Tool Co., Sidney, Ohio., at a meeting earlier this week, unanimously approved the establishment of a fund of \$30,000 from which over the next five years 15 scholarships of \$2,000 each will be awarded, three each year, to boys graduating from Shelby County schools with high scholastic records and ambitions to pursue the study of mechanical or electrical engineering at a leading college or university, whether in Ohio or elsewhere in

the country. Each of the \$2,000 scholarships will be disbursed in amounts of \$500 annually towards a complete four-year engineering college course. This figure will defray a substantial part of the college expenses.

Monarch executives consulted with school authorities locally and at a number of colleges and have established three conditions which must be satisfied by the applicant for a scholarship. These, in the order of their importance, are (1) superior scholastic performance, (2) seriousness of purpose, and (3) aptitude for the work.

"Our emphasis on mechanical or electrical engineering," Jerome Rateman, Monarch president, explained, "is because it is becoming more clear every day that Sidney is destined to grow as an important industrial city, and we hope the winners will want to give Sidney companies preference in seeking jobs."

the country.

A permanent Board of Trustees, composed of the judge of Common Pleas Court, the superintendents of county and city schools, the director of the Holy Angels School, and an executive of The Monarch Machine Tool Company, has been set up to review the qualifications of candidates. Present incumbents of these offices who have accepted appointment are Judge H. A. Berry, Superintendent C. E. McCorkle, Superintendent F. B. Louys, Father Lehman, and Monarch's vice president, D. H. McKellar.

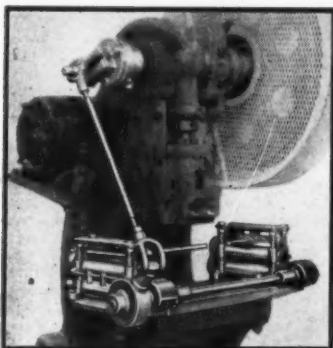
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Increase the efficiency of your punch presses with Automatic Roll Feeds



- Easily attached to any press.
- Completely automatic in operation.
- Presses produce 100% of operating time.
- Precision built for consistent and accurate feeding and long life.
- Simple design — easy to maintain.

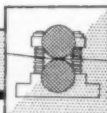
Standard models from 3" to 12" wide with up to 18" advance in both single and double feed models. Larger feeds and longer advances can be made to your specifications.

We also manufacture a complete line of Stock Reels, Stock Straighteners, Wire Straighteners and Scrap Cutters.

Write to-day for literature and quotation forms.
La Bahn Machinery and Mfg. Company,
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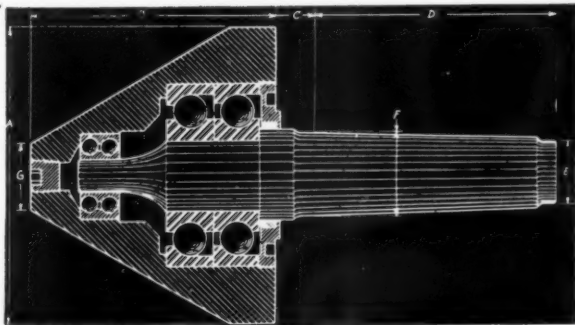


MACHINE & MFG. CO.

MENLO PARK • NEW JERSEY

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BULL NOSE HEAVY DUTY LIVE CENTER



In this type Roofs Live Center the spindle is mounted on high quality Duplex Ball Bearings in the large end and a Double Row Ball Bearings in the small end of the nose. Perfect alignment with any type of work.

Range of diameters are, No. 2½" to 3¼" and No. 7-2" to 7½" permits the use of a single center for a variety of diameters, suitable for pipe and other hollow equipment.

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Gentlemen: Please send me your illustrated brochures which give complete prices and specifications on Procunier High Speed Tapping Heads and Machines.

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a welded joint of equal sections which is not stronger and will not break the plate in tension.

If a welded joint is made of equal strength to a riveted joint, the riveted joint is accepted, the welded joint rejected.

If a welded joint is made of equal ductility to a riveted joint, the riveted joint is accepted, the welded joint rejected.

If a welded joint is made with the same undercut from calking, as is normally done in a riveted joint, the riveted joint is accepted, the welded joint rejected.

If a welded joint is made with the same porosity as a riveted joint, the riveted joint is accepted, the welded joint rejected.

If magnaflux or x-ray is used on a welded joint and it shows the same voids as it would on a riveted joint, the welded joint would be rejected, the riveted joint accepted.

If a welded joint is made with the same surface appearance as a riveted joint, the welded joint would be rejected, the riveted joint accepted.

If a welded joint is made with the same fatigue value as a riveted joint, the riveted joint would be accepted, the welded joint rejected. If a welded joint is made with the same tightness as a riveted joint, the riveted joint would be accepted, the welded joint rejected.

Perhaps what we need is a new code for welding code writers.

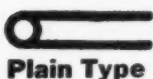
CODE RESTRICTIONS ON WELDING

By James F. Lincoln, president

The Lincoln Electric Co., Cleveland 1, O.

Welding construction is being handicapped by code writers putting restrictions of no value, but of great expense, on welded structures.

Results have been satisfactory, yet it is impossible to make a riveted joint as strong as the parent metal. It is however, impossible in mild steel to make



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Plain Type

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CONTINUOUS HINGES

All hinges shown can be furnished with special holes, cutouts and bends to blue-print in metals to suit the job.

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& MFG. CO.**

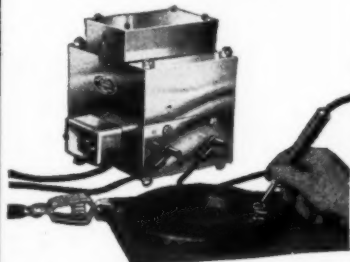
**1110 E. 87TH ST.
CHICAGO 19, ILL.**

SPECIFICATIONS:
Open Width $\frac{1}{8}$ " to 6"
Gage Material .040 to .125
Pin Diameter .101 to $\frac{1}{8}$ "
Lengths to 120"

THREE-FOURTHS OFFSET.

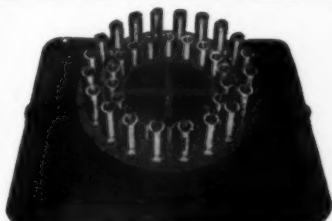
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LUMA Master Etchtool



The master of them all. Meets every marking requirement in any shop. Has 24 stages of control for regulating depth of marking . . . from extra light to heavy. Will stand heavy continuous production on all kinds of metal, rough or finished. Write for details.

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Pictured: a 38-Spindle Heavy-Duty Drill Head.

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M-100 is built for long and steady service.

This sturdily constructed bench drilling machine is available in 1, 2, 3 and 4 spindle models . . . speeds from 4,000 to 10,000 r.p.m.

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West Hartford, Connecticut

IMPROVE SYSTEM FOR PRICING EXTRUDED ALUMINUM SHAPES

"Pricing of aluminum extruded shapes has been on an unrealistic basis for so long and so many possible users have been discouraged that extruded aluminum shapes are not being utilized to anywhere near the extent they should," said D. P. Reynolds, Vice President, Reynolds Metals Co., Louisville, Ky., in a statement. "That is why Reynolds Metals has taken the initiative and is introducing a new pricing system."

The old system sought to cover the ef-

fect of variations in shape and size on extrusion costs by a formula that divides the weight-per-linear-foot of the individual shape by the perimeter of that shape. However, production experience shows that this system does not price the product in a true relation to total production costs because no consideration is given to the complexity of the shape and not enough consideration to the weight-per-linear-foot.

Under the Reynolds system, a formula is employed which allows the price to bear a more correct relation to actual costs because it gives adequate recognition to the effect of complexity in producing the shape. Prices are grouped into five classifications according to the difficulty of manufacture. To determine into which classification a part falls, a factor "d" is found by multiplying the circumscribed circle diameter in inches, by the square of the perimeter of the shape in inches, divided by double the cross sectional area of the shape in inches.

This figure is then used in a table along with the circumscribed circle diameter to determine into which of five difficulty classifications the part falls. Prices being published at this time cover solid extrusions only.



★ THE ★ WONDER CUTTER

The lowest-priced wire and rod cutter on the market. The hardened cutters last indefinitely.

Hand operated. A giant for work, cuts wire and rods up to $\frac{3}{8}$ -in. round or $\frac{3}{8}$ -in. square and band iron up to $\frac{1}{2}$ in. by 2-in. Adjustable stop for repeated cuts to same length. Large or small, your shop can use a WONDER CUTTER.

Write today for prices.

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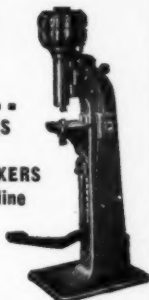
Cleveland, Ohio



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RIVETERS...

**PIONEERS
and
PACEMAKERS
in their line**



—head rivets from smallest to $\frac{1}{2}$ " diameter either by NOISELESS SPINNING or VIBRATING HAMMER method—Sizes to meet all needs—Types include Vertical and Horizontal Multiple Spindles.

Write for literature and don't forget to send samples.

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**PRICE TAGS
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Adjustable

MULTIPLE DRILL HEADS
Fit any machine, 2 to 10 Spindles.
Save 2 to 10 Operations.

PRICES

U-1 3 Spindle Head	PRICES
4 " "	\$150.00
5 " "	155.00
6 " "	160.00
7 " "	170.00
8 " "	180.00
10 " "	200.00

6" DRILLING AREA

$\frac{1}{2}$ capacity
21/32 center



IMMEDIATE DELIVERY!
WRITE TODAY
For descriptive catalog.

PRICES

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10 " "	339.00
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10" DRILLING AREA

$\frac{1}{2}$ capacity in cast iron standard
 $\frac{3}{8}$ special adaption in cast iron



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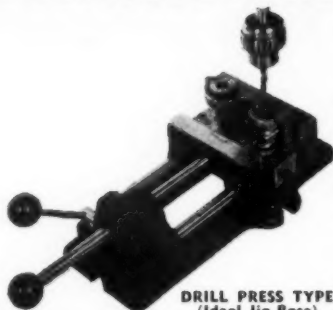
Also manufacturers of all types of fixed center heads

UNITED STATES DRILL HEAD CO.

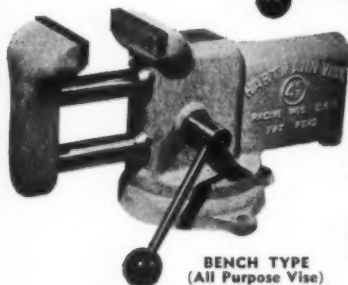
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STAMPING INDUSTRY ACTIVITY ENLARGED

Addressing the meeting of the Cleveland District Pressed Metal Institute, Tom J. Smith, Jr., president of the Pressed Metal Institute (122 E. 42nd St., N. Y. 17), stated that:

"Under such a situation of shrinking ore supplies it does not seem reasonable to continue to put from 350 to 700 pounds

of cast iron into a bathtub when a 5' x 7' x 14 gauge blank can be placed in a press and a steel bathtub weighing approximately 125 pounds formed, nor can from 40 to 80 pounds per section be put into cast iron radiation for hot water or steam heating when sections can be pressed out of far lighter metal... Between research on the part of engineers of the stamping manufacturers and engineers of the mechanical and hydraulic press builders, the horizon of the stamping industry has been greatly widened."

A serious problem facing the stamping industry is the encroachment of metal producers into stamping and end product areas. Industrial mobilization and assistance to Europe, China, Greece and Turkey will add nothing to stock piles. "Part of the current metal scarcity is due to the domination of the coal industry by the miner's union. In the steel industry

normal distribution has become highly involved, and distant points of questionable utility... were arbitrarily cut off from their sources of supply while the industry strove, under a multiple basing point system, to sell metal. The basing point system of pricing has been under fire for more than forty years."... The Federal Trade Commission is currently complaining against the steel industry.



A REAL HELPING HAND

It's a help that die makers, tool makers, machinery builders and general machinists have long sought—a more accurate and surprisingly faster way of transferring blind screw holes.



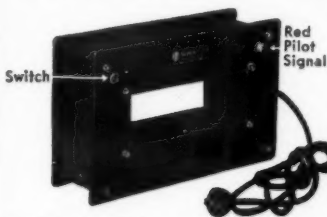
The Heimann Transfer Screw Set is a self-contained, complete tool. No wrenches or pliers are necessary. Made in $\frac{1}{4}$ " to 1" diameters. Send for pricelist.

HEIMANN MFG. CO.

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AMC Quick DEMAGNETIZER



A necessity where machine tools are used.

Standard units available and special sizes to order.

Write today for descriptive circular

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1629 Madison

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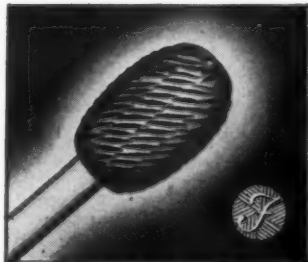


The RIGHT TOOL to remove a broken tap is a WALTON TAP EXTRACTOR. This specialized tool has paid for itself time and time again, throughout the metal working industry, in both time saved and pieces salvaged. It will pay you to keep your crib stocked with a full set of Walton Extractors.

Learn about Waltons at our expense. Write for folder No. 12 and full details about our 30 DAY FREE TRIAL OFFER.

THE WALTON COMPANY

Hartford 10, Connecticut



FORD ROTARY FILES

The Right File for the Right Job

For over 25 years Ford rotary files have been known for their high quality and precision workmanship. They are available from your mill supply house.

Three Distinct Types

1. Hand Cut Files
2. Ground Burs
3. Carbide Cutters

M. A. FORD MFG. CO., INC.

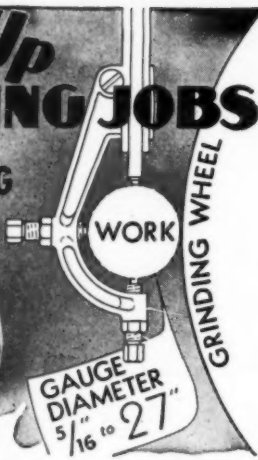
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Speed Up GRINDING JOBS

With Automatic
DIAMETER INSPECTING
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VISUAL
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DURING
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Pratt Grinding Gauges caliper external cylindrical jobs while work is in motion or at rest. Adapted to straight or tapered work. Tolerances of .0001" plus or minus easily maintained. Visible check on out of roundness, rough grinding and chatter. Cannot grind work undersize unknowingly. Easily installed on any grinder. Pratt Grinding Gauges increase production, eliminate scrap and assure accuracy. A modern precision tool, ruggedly built.

American

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Send for Bulletin

LAB SPEEDS JET DEVELOPMENT AT WESTINGHOUSE

To explore new frontiers in its continuous improvement of the "Yankee" line of turbojet engines, Westinghouse has designed and built under Navy sponsorship an unusually complete Gas Turbine Engineering Laboratory. Although the Lab has been in full operation for some time its existence was publicly revealed only recently.

It contains extensive facilities for testing compressors, combustors, turbines and accessories, the four basic compon-

ents of a gas turbine power plant. The noise-free, elevated control room, constructed of foot thick reinforced concrete with double panes of bulletproof glass for observation is flanked on either side by the high-power turbine, and high-power compressor test areas. An intercommunication system provides communication with the test floors.

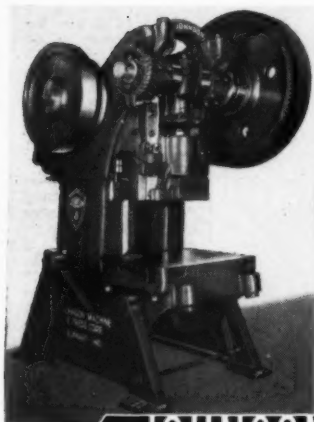
For turbine testing, two multi-stage, wide-speed-range, steam-turbine-driven, axial-flow compressors can be operated individually or in series with intercooling to supply up to 58 lb./sec. of air at pressures up to 118 psia. A combustor capable of releasing up to 85-million Btu hr. acting with the compressors provides gas to operate the turbine being tested at pressures up to 8 atmospheres and 18-00 degrees F. Turbine output that sometimes reaches 18,000 hp at 15,000 rpm is absorbed by

specially designed water brakes.

Compressors undergoing test are driven by a wide-speed-range, controlled torque steam turbine. Power input is measured directly. The system can handle 6000 hp at 20,000 rpm with discharge pressures to 150 and inlet pressures to 90 psi. Piping and service equipment for both of these high-power test areas is under the test floor.

The hot-spin test pit permits mechanical tests on bladed disks to destruction if desired. Shell of the pit is encased in lead brick, laminated steel and concrete.

NOT TOO BIG FOR SMALL RUNS—NOT TOO SMALL FOR BIG RUNS



90 TONS
and MORE DIE SPACE!

Johnson

No. 8

**INCLINABLE
POWER PRESS**

Extra thick bolster plate interchangeable with thin steel bolster . . . massive semi-steel cast frame . . . extra long gibs . . . friction type brake . . . patented tripping device.

JOHNSON

MACHINE AND PRESS CORP.
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THIS KIT BELONGS IN YOUR SHOP



With it you can cut keyways by hand in *one minute* in gears, cutters, couplings, collars, pulley hubs, etc.

QUICKLY PAYS FOR ITSELF

Cut a few keyways — the Kit covers a wide range of standard widths and depths — and you've saved the cost of the Kit and of a du Mont Arbor Press for this and many other shop uses.

Ask your Industrial
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**the du MONT
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KEYWAY
BROACH KIT**
or mail this coupon

The du MONT CORPORATION, GREENFIELD, MASS.

Please mail me the *Minute Man* Manual "T" containing complete description and prices of Keyway Broach Kits and valuable reference information.

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MAKE or HEAT TREAT
TOOLS or DIES ...**

TOOL STEEL SIMPLIFIED

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**BROWN INSTRUMENT ANNOUNCES
\$2,500,000 EXPANSION PLAN**

A \$2,500,000 expansion program, announced by Brown Instrument Company, Philadelphia, will add more than 60 per cent to its present manufacturing space and a proportionate increase in employment, said Henry F. Dever, president.

Increased sales, which have climbed steadily from war peaks, and expanded research and engineering activities, made necessary by the growing industrial use of the type of automatic controls produced by the company, were the main

considerations behind the move, he stated.

The program includes construction of a four-story addition to the main plant at Wayne Junction. The foundation and footings of the new wing are designed so that four additional floors may be added at a later date.

When completed, the first four-story structure will enable the company to combine some of its outlying leased sites and simultaneously provide needed space and production facilities to keep pace with the present high levels of business, the Brown official explained.

"While industrial instrumentation has been in wide use for many years, the emergencies of war and the consequent need for high volume production of precision products greatly broadened the need for automatic control in all major industrial fields," Dever said.

"Since victory, instrumentation has been relied on to an increasing extent to help offset rising raw material and labor costs and bring about greater production efficiencies."

According to architectural plans, the new building will add 95,000 square feet to existing main plant space. The addition will comprise five floors, including a basement of about 19,000 square feet per floor. Because the foundation is designed to support four additional floors, the new wing will eventually make possible an addition of 171,000 square feet to the present building.

NOTCHING TUBING OR PIPE ENDS EASILY WITH

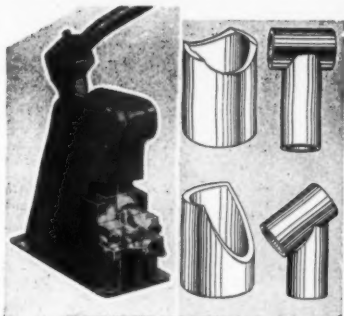
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DIAMOND DRESSERS

by **CARBOLLOY®**

BUILDING CONTRACTS SET NEW QUARTER MARK

F. W. Dodge Corp. (119 W. 40th St., N. Y. 18) has reported that a new first-quarter high mark in dollar volume of construction contracts has been set in the thirty-seven states east of the Rocky Mountains with a total of \$1,986,936,000, 23% over the first quarter of 1947.

While the dollar volume of residential contracts was maintained at a level equal to the first quarter of last year, non-residential contracts were up 42% and heavy engineering awards increased 46%.

are: upstate New York; the Middle Atlantic states; the Southeastern states; southern Michigan; northern Illinois, Indiana, Iowa and Wisconsin; eastern Missouri, southern Illinois, western Tennessee and Arkansas; Louisiana and Mississippi; Minnesota, North Dakota, South Dakota; western Missouri, Kansas, Nebraska and Oklahoma. Other regions showed a gain over the first quarter of last year except New England, metropolitan New York and northern New Jersey, southwestern Ohio and Kentucky, and Texas.

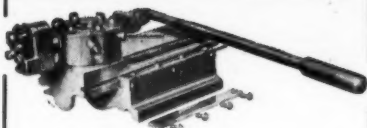
over the comparable period of 1947.

Thomas S. Holden, president of the fact-finding agency for the construction industry, in an interpretation of the activity record pointed out that the sharp increase in construction costs during the last year accounted for some, if not all, of the dollar volume gain.

The physical volume of nonresidential space as measured by square foot floor area and covered under contracts awarded in the first quarter was substantially in excess of that reported for the corresponding period of last year, Mr. Holden said. At the same time considerably less new floor area is reported for residential buildings.

Gains in dollar volume of construction contracts were shown for eleven of the corporation's fifteen reporting regions. Those areas whose gains were equal to or greater than the average for the thirty-seven states

MORE PROFITS FROM YOUR LATHE



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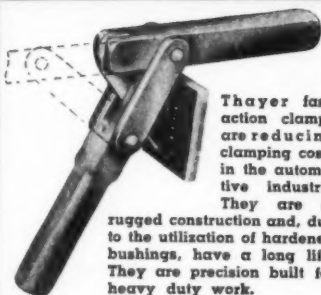
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"Whenever there's trouble with tools or finishes, or jobs fall behind schedule, the first thing I check is the cutting fluid, because when that's not exactly right, it's surprising how it can upset the whole job. You just can't get around it, cutting oils do make a big difference . . . and it isn't smart to quit trying until you find the right one. It doesn't make sense to put up with headaches that can be avoided. That's why I think it pays to rely on experienced cutting oil people. They come up with sound, practical assistance."

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RESISTANCE WELDING CONTEST ENDS JULY 31

A first prize of \$750 and other prizes ranging from \$200 to \$500 will be awarded by the Resistance Welder Manufacturers' Association for the best papers dealing with resistance welding subjects submitted to the American Welding Society before July 31st, 1948.

First prize will be awarded to the best paper by individuals in industry, private or government laboratories, or in consulting engineering work. There are no restrictions as to the scope of the subject matter, providing it deals specifically with resistance welding.

Included in the subject matter of winning papers in previous years are:

1. Design or redesign of a product or products for fabrication by resistance welding, for reduced cost, increased production, etc.

2. Research on resistance welding.

3. Development of new procedures which broaden the field of application for resistance welding.

A second prize of \$500 and a third prize of \$250 are to be awarded other

papers in this category.

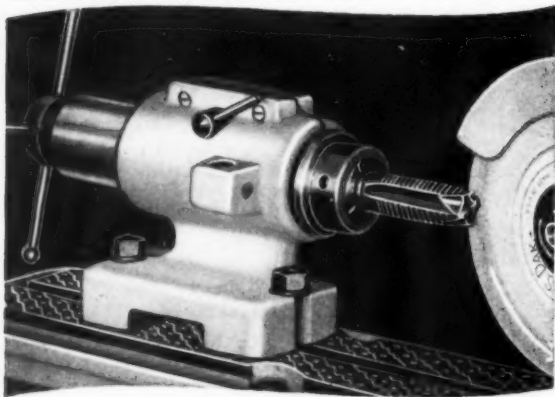
A first prize of \$300 and a second prize of \$200 will also be awarded for papers from a university source—either by an instructor, a student, or a research fellow.

The contest is open to anyone from the United States, its possessions, and Canada. Minimum length requirement is 2500 words.

Full details are available from Resistance Welder Manufacturers' Association, 505 Arch St., Philadelphia, Pa., or from the American Welding Society, 33 West 39th St., New York, N. Y.

FORM GRINDING SERVICE

Folder describes and illustrates 29 types of Form Tools assuring close accuracy to fine tolerances in grinding. Brief presentation of usefulness of intricate and precise Form Tools. J & S Tool Co., Inc., Dept. BB, Main St., East Orange, N. J.



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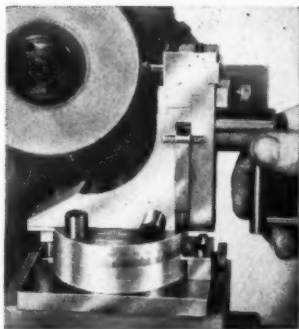
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At last, a saw which cuts anything, stainless steel, rubber, wood, aluminum, etc. Blade has a variable speed which is set in 45 seconds . . . the stroke length of the blade is adjustable depending on thickness of materials. Transa has

twice the power on the cutting stroke due to a special gearing arrangement.

Special guides for each width of saw blade eliminate whipping, turning or cracking the blade, and acts as a cutting

guide at the same time. Transa guns are used extensively in machine shops, assembly plants, fabricating industries, repair and shipping departments.

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ECA NEEDS MILITARY SUPPORT

Prompt adoption by the United States of an effective bi-partisan policy free of "day-to-day expedients" and backed by guarantees of adequate military support was urged by William L. Batt, president of SKF Industries, Inc., Philadelphia, Pa., before a joint dinner meeting of the Engineering Society of Milwaukee and the American Society of Mechanical Engineers of Milwaukee.

Batt outlined a three-point program which would give "unmistakable evidence" of "our interest in a peaceful

world." It called for: A re-statement of U. S. foreign policy "in the clearest and most certain term;" a guarantee to the 16 cooperating nations that "we will protect the European recovery program from violent outside interference or irresponsible meddling;" creation of a world government that will permit peace-loving people "to live under the assurance of peace—not the ever-present menace of war."

The people should be told "what our foreign policy is and what its objectives are."

"That statement, to be most effective, should be supported immediately by a pledge from the responsible heads of both major political parties—and perhaps even from the various presidential candidates—that the outcome of the November elections will not alter the foreign policy of the United States," Batt asserted.

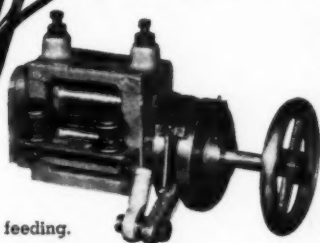
Turning to world government, Batt said the United Nations, in its present form, is "clearly incompetent" and declared the immediate need is a world organization with "teeth in it."

Mobilization of the nation's economic resources to preserve a free Western Europe makes adequate military protection an "absolutely indispensable step," Batt said, but he warned against American meddling.

"It is not too late to arrive at an honorable settlement and by 'honorable settlement' I do not mean appeasement."

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Fits any press for side or rear feeding.
 Can't slip even in bath of oil.
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FALLS "DOLLAR STRETCHER"



THREADED LATHE CHUCKS

stretch your dollars because: one, low initial cost, two, no dollars wasted in machining an expensive adapter as the chucks are already internally threaded for mounting on threaded lathe spindles, and three, because of short overhang, production dollars are saved due to increased work speeds without chatter.

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No. 2-20 Milling Machine—Table, 42" x 12"
Table travel, 20".

KENT-OWENS *Milling Machines*

TURNING POINTS IN THE METALWORKING INDUSTRY

(Taken from a paper by Myron S. Curtis, Warner & Swasey Co., presented to the Westinghouse Machine Tool Forum.)

"Production" is the only salvation of any civilization.

Wealth — things created — has been dissipated by the most total and destructive war ever known. Europe is in a destitute state. Here in the United States, we seem to have plenty of the necessities and luxuries of life. But we are faced with increasing prices. Now this

devaluation of the dollar is basically just as much a sign, and a result of the destruction of wealth as is a bombed-out factory or a crumbled city. When there is plenty of wealth and abundance of things, the dollar buys a lot. When wealth disappears, the dollar buys little.

There is only one way to increase wealth, and that is by producing it, by production. We must not only produce wealth for ourselves, but for Europe also. This, of course, is not entirely humanitarian — a healthy Europe is necessary for a healthy America.

Now as far I know, there are only two ways to increase production — increase the productivity of the individual by having him work harder or provide him with tools of increased productivity, so that with the same amount of work he will produce more goods.

The American way is to give men

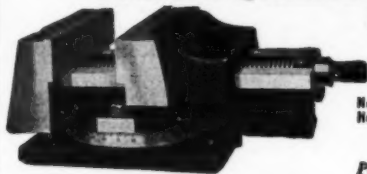
tools with which they can outproduce other nationals. What is the machine tool industry doing to meet this challenge of production? The industry lives only by moving forward — it is based on ever-increasing production, and making new and better tools for producing.

I intend to discuss the broad aspects of a few of the principal developments which have been worked out for increased production.

The productive capacity of any machine tool is controlled by 2 major fac-

(Continued on next page)

SUPERIOR QUALITY AND WORKMANSHIP IN PLUNKET VISES



SQUARE BASE SHAPER VISE

The Shaper Vise has graduated swivel base and tongue in center to fit slot in table, and has holes for bolting down. In ordering this vise give size of slots in Shaper Table, also distance from center to center of slots.

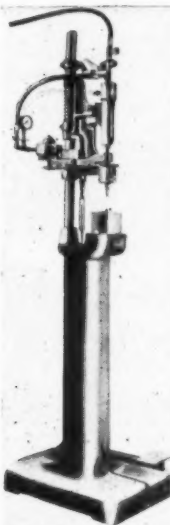
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No. 4, 6" jaws, 1 1/2" deep, opens 8". Weight 45 lbs. **\$55.00**

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Prices are net, f. o. b. Chicago. Write for illustrated folder today. Dealers inquiries solicited.

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Interchangeable heads with Capacities: 3/32", 5/32", 1/4" and 5/16"

Speeds 4,000 to 10,000 stroke blows per minute

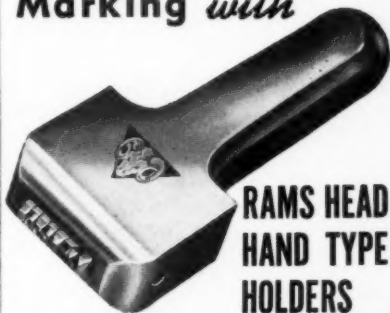
Assembles metals, wood, rubber, die cast, fibre, porcelain, plastics, etc. Throat depth 4 1/4". Motor consumes 6 c.f.m. @ 25 p.s.i.

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**KEMPSMITH
ARBORS**

in all popular sizes or types. Adaptable to ANY make of milling machine with standardized spindle.

bides has made people speed conscious. Some of the striking illustrations of cutting speed possibilities are in the nonferrous metals, and I am thinking particularly of the set-up for bar milling during the war. Airplane wing spars of aluminum were machined up to speeds of 12,000 feet per minute. Naturally, the next thing to do was to find out how fast aluminum could be turned. The Aluminum Company of America made a series of exhaustive tests. Eight inch diameter rolled stock was turned on a lathe at speeds up to 10,000 feet per minute, depth of cut of $\frac{1}{4}$ " and a feed of .014 per spindle revolution. Cuts were also made at a cutting speed of 20,000 feet per minute with a $\frac{1}{8}$ " depth of cut and .020 feed per spindle revolution. The chips came off at a tremendous speed in a continuous horizontal stream to a distance of thirty or forty feet from

(Continued from prev. page)

tors — machining time and handling time. In order to effectively increase the productive capacity of a machine tool, attention must be given to both of these factors.

The most marked improvements in machine tools have always been forced by the development and appearance of new cutting materials. The appearance of carbide cutting tools in 1928, together with improvements in the carbides themselves since that time, and the development of techniques in the use of car-

the machine.

This is all very interesting as a laboratory test, but what would you do with that speed in a lathe spindle if you had it?

Perhaps it is possible to approximate these speeds in turning bar stock where the bar, if symmetrical, is in balance, but of course, it is impossible to consider these high cutting speeds with castings or forgings where not only is the piece out of balance to start with, but where the balance constantly changes as ma-

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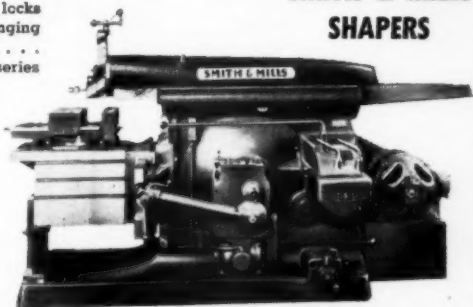
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Patented stronger ram eliminates old style slot . . . gives added strength with no weight increase. Ram position locks automatically. Improved stroke changing mechanism allows positive locking . . . distributes shock and wear over series of bull gear teeth rather than one tooth. Angular indexing tool head.

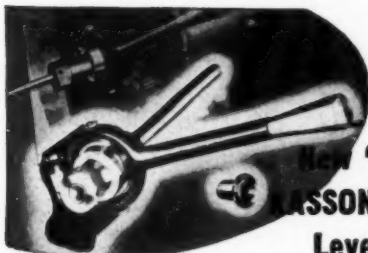
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**3-POSITION
Tension Adjustment!**

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KASSON Precision
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For ATLAS
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BEND 9' Lathes

POSITIVE GRIP . . . An easy push of lever adjusts to compensating positions for undersize, oversize, or standard diameter work. **AND NO FINGERS!** Patented co-ordinate cam principle eliminates them. Result is design simplification and fewer parts to wear out. **Inquire about 10-day FREE TRIAL OFFER!**



A million KASSON PRECISION lathe collets permitted machines to turn during the war . . . They **HAD** to be right — for accuracy, for fit, for longer life. Unconditionally guaranteed, of course.

IMMEDIATE DELIVERY! Ask your distributor for KASSON PRECISION collets and lathe attachments. **WRITE US FOR LITERATURE.**

KLUTCH - KOLLETS are mighty handy too. For accurate chucking work to 2 3/4" diameter, at very low cost. Soft head for easy boring. Fit standard adapters for 3AT, 3C, 1A, 5C, collets.



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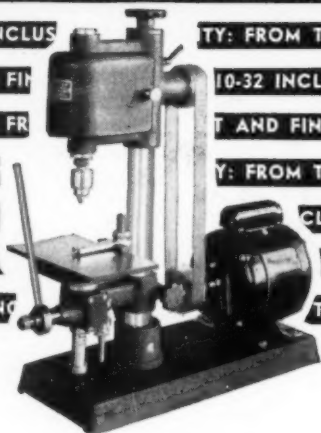
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When tapping operations must be precise, and the materials used differ in characteristics as widely as paper and monel, or ceramics and bronze; then the precision and instrument industries should specify, and demand, the

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Taps to the very bottom of blind holes. Reduces tap breakage to an absolute minimum. Built ruggedly . . . for fast and continuous service on tight production schedules.

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TAPPING MACHINES · PORTALVATORS

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(Continued from prev. page)

terial is removed.

You can't just say — I'm turning a piece in two minutes at 1000 spindle r.p.m., so I'll increase my spindle r.p.m. to 2000 and do the piece in one minute — things are not as simple as that. Most turning jobs require the starting, stopping and sometimes the reversal of the spindle.

High speed is actually responsible in many cases for lower production by increasing what we might call handling time. We have many examples where the

heavy depth of cut, the second choice for heavy feeds, and third for high speed. Excessive speed is the great enemy of cutter life and this should be avoided wherever possible.

We definitely feel that we have reached the place where machining time cannot be reduced further. On the other hand, it has been realized that the greatest gain toward greater productivity is to be made by focusing attention on handling time. The cutting time can be decreased, but if handling time is thereby in-

(Continued on next page)

floor-to-floor time was materially increased by trying to machine at some theoretical high speed. The increased time to start, reverse and stop the machine more than offset any reduction in machining time.

We at the Warner and Swasey Company have for some time conducted a program of research on the extent and limitations of practical carbide applications, which program has yielded much valuable information about the interrelationship between cutting speed, feed per revolution, depth of cut, rate of metal removed in cubic inches per minute and cutter life. The main conclusion arrived at is that in the interest of longer cutter life, whenever there is a choice of combination of speeds, feeds and depth of cut which can be used for the given rate of metal removal, the first choice should be in favor of the

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PRECISION GRINDING

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- EXTERNAL
- CRUSH FORM
- CENTERLESS
- TWIN DISC
- SURFACE
- THREAD



Acme is equipped to handle all types of precision grinding. Expert craftsmen, using newest methods and modern equipment, will do the job for you faster, better, more economically. Acme also offers a flat lapping service that can finish surfaces to within millionths. Write for details.

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Special

for JIG BORING WORK

Here the Super-Spacer is demonstrating another of its advantages to any tool room. Equipped with a face plate for exact location of work, it can be used on your jig borer to save indexing time, and production cost per piece. The Super-Spacer takes milling, drilling, grinding, planing, slotting, boring and other operations in stride. Investigate its benefits to your shop. Write Dept. S7.

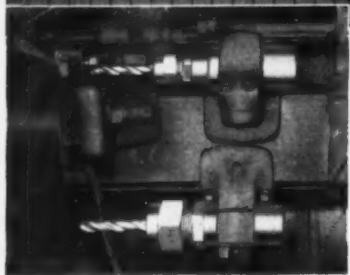
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Production Up 88%
CYCLE TIME **DOWN**
FROM 18 SECONDS TO 11



Valve manufacturer steps up feeds and speeds; cuts time and jumps output (figures above); uses Erickson's three proven principles:

(1) gripping drill on flutes, permitting stubbing and reducing overhang; (2) rigid grip due to 8-line contact full length of collet and even collapse through 1/32" range; (3) getting .0005" accuracy — no chatter or torn cuts. See what Erickson Collet Chuck Accuracy will do for you.

Ask for Catalog "T-6" or Erickson engineer or both.

ERICKSON TOOLS DIVISION
2310 Hamilton Ave. • Cleveland 14, Ohio



(Continued from prev. page)

creased or even if it remains the same, the overall time saved begins to decrease.

Along with cutting and handling time, the production time on metal parts depends greatly upon the degree of finish given to them and we are not too accurate in our thinking on this score. The general tendency of the metal working industry, and particularly the machine tool industry, is to produce better finishes than are necessary.

Every surface produced by a ma-

chining operation is intended to perform a function, including the function of appearance. Production has been cut and cost reduction has been seriously hampered because our habits of thinking have made synonyms out of the words quality and expensiveness.

So far we have been discussing the actual removal of metal, both as to quantity and quality. The important part of machine tool design lies in the intermediary mechanism, between the primary drive of the machine and the final application of that drive to the business of metal removal. Any improvement in that mechanism must have as its object, not only increased production, but increased efficiency of production — two entirely different things, for this efficiency takes into consideration not only machine productivity, but reliability and life, ease of servicing, and cost of ma-

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Take, for example, spindle drives: Some are mechanical, some hydraulic, and some electrical, but they all have these things in common — they are very expensive to build, cost a lot to buy, are complicated and bulky, and do not quite fill the bill.

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[Arrow, in illustration, points to precision angle adjustment screw.]

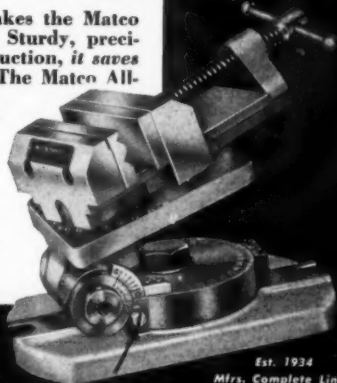
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No Levers
No Packing**



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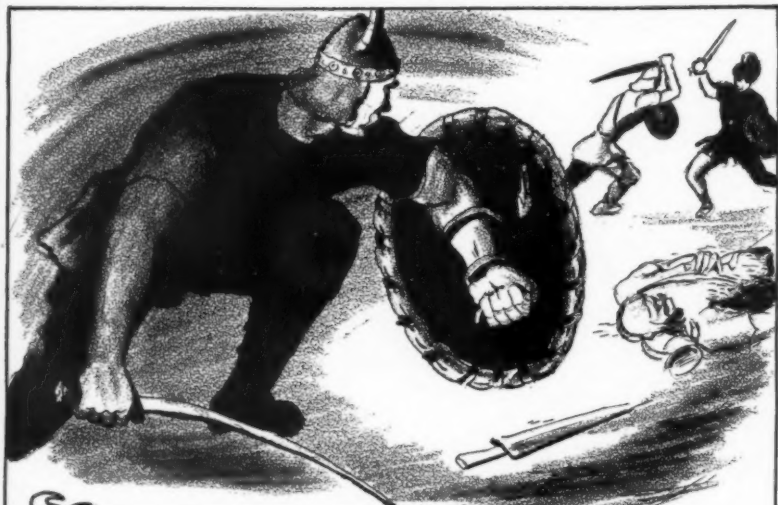
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Mechanics Through The Ages



SO SOFT WERE THE IRON SWORDS USED BY THE GAULS IN THEIR EARLY BATTLES WITH THE ROMANS THAT, AFTER EVERY STROKE, THEY WERE OBLIGED TO CEASE COMBAT LONG ENOUGH TO STRAIGHTEN OUT THE BENT BLADES.



BECAUSE — THE SCAFFOLDING THEY WORKED ON WAS CALLED "MACHINA" (A MACHINE), THE PLASTERERS OF ANCIENT ROME, WERE KNOWN AS "MACHIO," FROM THIS TERM DERIVES OUR MODERN WORD "MASON."



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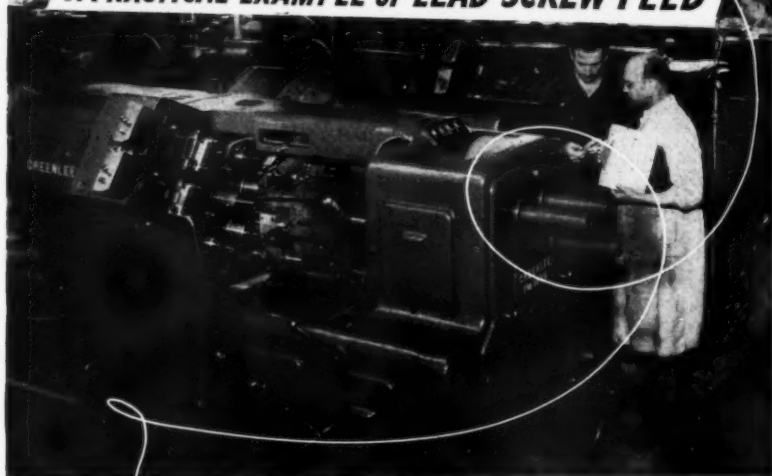
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A PRACTICAL EXAMPLE of LEAD SCREW FEED



FOR *Better* PRECISION THREADING ON **GREENLEE SIX-SPINDLE AUTOMATICS**



SET-UP DATA

PART: 1" Hose Stem. MATERIAL: 1½" hex. B1113 Steel.

Position	Operation
1	Form Pipe Diameter. Spot Drill (60° grind).
2	Rough Form Back of Hex. Drill 57/64" Hole and Face End. (High Speed Drilling Unit).
3	Finish Form Back of Hex. Drill 7/8" Hole Part Way (High Speed Drilling Unit). Finish Seat, 30° Knee Tool.
4	Rough Form Remainder. Drill 7/8" Hole Through. (High Speed Drilling Unit).
5	Finish Form. Cut 1" Tapered Pipe Thread (Lead-Screw Feed Unit).
6	Cut Off.

FEED: 0.013". STROKE: 1½"
RUN: 10,000

WRITE FOR free literature describing the new interchangeable lead-screw feed and the quick-change advantages of the Greenlee Automatic.

To improve the quality and appearance of their product — industrial hose fittings and couplings — the Anchor Coupling Company at Libertyville, Illinois, are making efficient use of the new Greenlee Lead-Screw Feed on fussy threading jobs. The hose stem part illustrated above has a 1" tapered pipe thread cut to a length of 7/8". The job requirement called for high production, a uniform precision-cut thread from start to finish, and a good external finish. How this job was handled using the smooth positive action of the lead-screw feed on a Greenlee "6" is described at the left. In addition to meeting job requirements, an estimated 10 percent reduction in production costs resulted. Today, more of the same equipment is employed by the Anchor Coupling Co. in the manufacture of a quality line of products.



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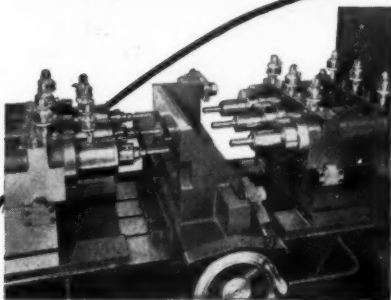
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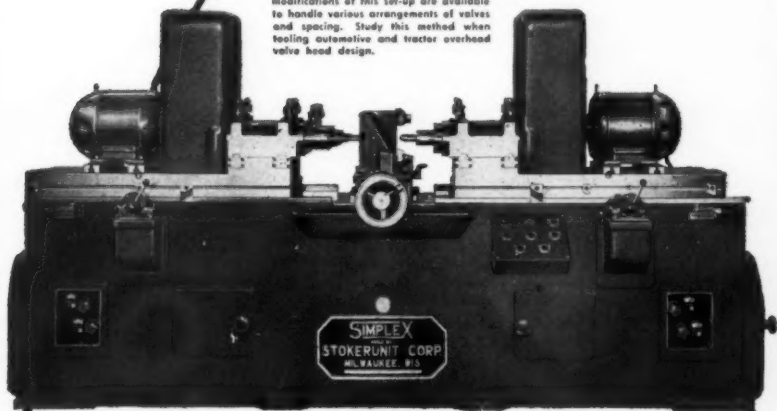
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SIMPLEX

The life and efficiency of a gasoline engine depends much upon the accuracy of valves and valve guides. One progressive manufacturer found that by placing the cylinder heads for an overhead valve engine in a simple cross-sliding fixture, semi-finish boring one side and precision boring the valve guides and valve seats from the other, he achieved the finest precision and engine performance.



This SIMPLEX 2U 2-way Precision Boring Machine, with three ± 1 spindles on each side and cross-sliding fixture, bors two intake and two exhaust valve guides and seats in a four step cycle. Many modifications of this set-up are available to handle various arrangements of valves and spacing. Study this method when tooling automotive and tractor overhead valve head design.



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V models have counterweighted vertical lift door.

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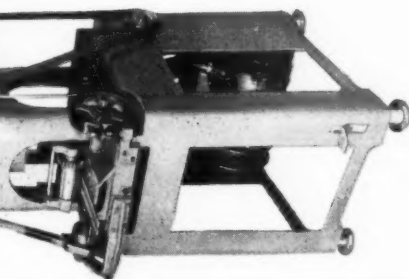
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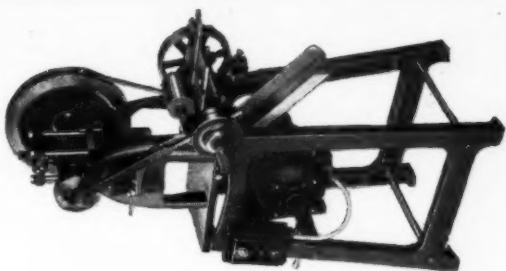
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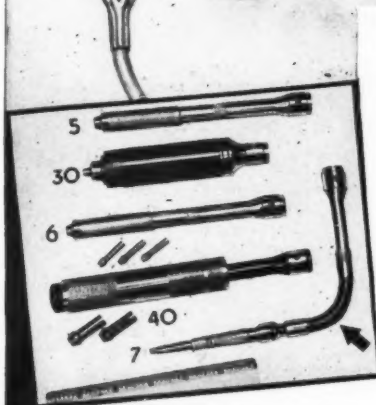
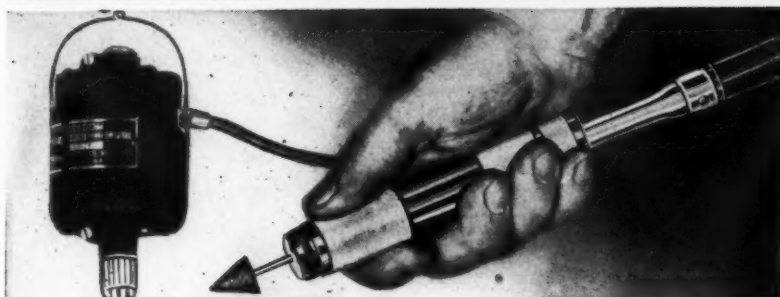
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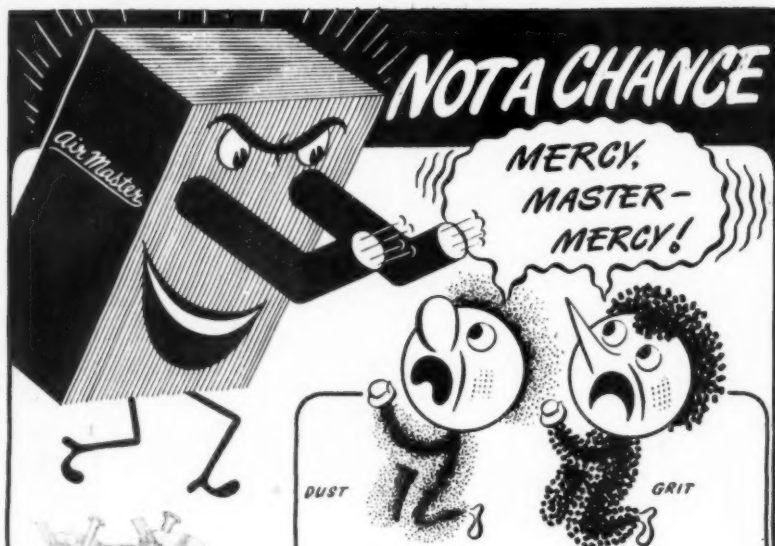
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